



## SEQUENCE LISTING

<110> HARRINGTON, JOHN JU  
SHERF, BRUCE  
RUNDLETT, STEPHEN

<120> COMPOSITIONS AND METHODS FOR NON-TARGETED ACTIVATION OF  
ENDOGENOUS GENES

<130> 0221-0003US

<140> 09/276,820  
<141> 1999-03-26

<150> 09/159,643  
<151> 1998-09-24

<150> 08/941,223  
<151> 1997-09-26

<150> 09/263,814  
<151> 1999-03-08

<150> 09/253,022  
<151> 1999-02-19

<160> 33

<170> PatentIn Ver. 2.1

<210> 1  
<211> 39  
<212> DNA  
<213> Homo sapiens

<400> 1  
tccttcgaag cttgtcatgg ttggttcgct aaactgcat

39

<210> 2  
<211> 40  
<212> DNA  
<213> Homo sapiens

<400> 2  
aaacttaaga tcgattaaatc attttctca tataacttcaa

40

<210> 3  
<211> 28  
<212> DNA  
<213> Homo sapiens

<400> 3  
atccaccatg gctacaggtg agtactcg

28

<210> 4  
<211> 36

RECEIVED  
NOV 08 2001  
TECH CENTER 1600/2900

<212> DNA  
<213> *Homo sapiens*

<400> 4  
gatccgagta ctcacctgt a gccatggtgg atttaa

36

<210> 5  
<211> 33  
<212> DNA  
<213> *Homo sapiens*

<400> 5  
ggcgagatct agcgctatat gcgttgcgc aat

33

```
<210> 6
<211> 51
<212> DNA
<213> Homo sapiens
```

<400> 6  
ggccagatct gctacctaa gagagccgaa acaagcgctc atgagccccga a

51

<210> 7  
<211> 6084  
<212> DNA  
<213> *Homo sapiens*

<400> 7  
agatcttcaa tattggccat tagccatatt attcatttgt tatatagcat aaatcaaat 60  
tggctattgg ccattgcata cggttatct atatcataat atgtacattt atattggctc 120  
atgtccaaa tgaccgccc gttggcattt attattgact agttataat agtaataat 180  
tacggggtca ttagttcata gcccataat ggagttccgc gttacataac ttacgtaaaa 240  
tggcccgctt ggctgaccgc ccaacgaccc cggcccatgg acgtcaataaa tgacgtatgt 300  
tcccatagta acgccaatag ggactttcca ttgacgtcaa tgggtggagt atttacggta 360  
aactgcccac ttggcagttac atcaagtgtt tcatatgcca agtcggcccc ctattgacgt 420  
caatgacggt aaatggcccg cctggcattt tgcccagttac atgacccttac gggactttcc 480  
tacttggcag tacatctacg tattagtcat cgctattacc atgggtatgc ggttttggca 540  
gtacaccaat gggcgtggat agcgggttga ctcacgggaa tttccaagtc tccaccccat 600  
tgacgtcaat gggagttgt tttggacca aaatcaacgg gacttccaa aatgtcgtaa 660  
caactgcgtat cgcccccccc gttgacgcaa atggggcggtt ggcgtgtac gtgggaggtc 720  
tatataagca gagctcgttt agtgaaccgt cagatcacta gaagctttat tgcggtagtt 780  
tatcacagtt aaattgctaa cgcagtcgt gcttctgaca caacagtctc gaacttaagc 840  
tgcagtgact ctcttaatta actccaccag tctcacttca gttccttttgc cttccaccag 900  
tctcaattca gttccttttgc catgaagagc tcagaatcaa aagaggaaac caacccctaa 960  
gatgagcttt ccatgttaat ttgttagccag cttccttctg atttcaatg tttcttccaa 1020  
aggtgcagtc tccaaagaga ttacgaatgc cttggaaacc tgggtgcct tgggtcagga 1080  
catcaacttgc gacattccta gtttcaaat gagtgatgtt attgacgata taaaatggga 1140  
aaaaacttca gacaagaaaa agattgcaca attcagaaaa gagaagaga ctttcaagga 1200  
aaaagataca tataagctat taaaaatgg aactctgaaa attaagcatc tgaagaccga 1260  
tgatcaggat atctacaagg tatcaatata tgatacaaaa gggaaaaatg tggggggaaa 1320  
aatatttgat ttgaagattt aagagagggt ctcaaaacca aagatctcct ggacttgc 1380  
caacacaacc ctgacctgtg aggtaatgaa tggaaactgac cccgaattaa acctgtatca 1440  
agatggggaaa catctaaaac tttctcagag ggtcatcaca cacaagtggc ccaccagcct 1500  
gagtgcaaaa ttcaagtgc cagcaggaa caaagtgc aaggaatcca gtgtcgagcc 1560  
tgtcagctgtt ccagagaaaag ggatccaggt gtagtagggcc cgatccttctt agagtcgagc 1620  
tctcttaagg tagcaagggtt acaagacagg tttaaggaga ccaatagaaa ctgggcttgt 1680

cgagacagag aagactcttg tttctgat aggacac tatggcggc 1740  
ttccaagctt gagtattcta tcgtgtcacc taaataactt ggcgtaatca tggcataatc 1800  
tgtttcgtt gtgaaattgt tatccgctca caattccaca caacatacga gcccggaa 1860  
taaagtgtaa agcctgggg gcctaattt gagaagacat gataagatac attgatgagt 1920  
atgttccat tttgtgaggg ttaatgctt gagaagacat gataagatac attgatgagt 1980  
ttggacaaac cacaacaaga atgcagtgaa aaaaatgctt tatttgcgaa atttgcgatg 2040  
ctattgcctt atttgcgatc attataagct gcaataaaaca agttaacaac aacaattgca 2100  
ttcattttat gttcaggtt cagggggaga tttttaaagc aagtaaaaacc 2160  
tctacaaatg tggtaaaatc cgataaggat cgattccgga gcctgaatgg cgaatggacg 2220  
cgccctgttag cggcgcattt agcgcggcgg gtgtgggtt tacgcgcacg tgaccgctac 2280  
acttgcgcg cccctagcgc cccgtcctt cgccttc ctttccttc tcgcacgtt 2340  
cgccggctt cccgtcaag ctctaaatcg ggggctccct ttagggttcc gatttagtgc 2400  
tttacggcac ctcgacccca aaaaacttga ttaggggtat ggttacgtt gttggccatc 2460  
gccctgatag acggttttc gccccttgc gttggagttt acgttctta atagtggact 2520  
cttgcgttccaa actggaaacaa cactcaaccc tatctcggtc tattttttt atttataagg 2580  
gattttgcg atttcggcctt attggtaaa aaatgagctg atttaacaaa aatttaacgc 2640  
gaatttttaac aaaatattaa cgcttacaat ttgcgttgc taccttctga ggcggaaaga 2700  
accagctgtg gaatgtgtgt cagttagggt gtggaaagtc cccaggctcc ccagcaggca 2760  
gaagtatgca aagcatgcat ctcaatttgc cagcaaccag gtgtggaaag tcccaggct 2820  
cccccaggcagg cagaagtatg caaagcatgc atctcaatta gtcagcaacc atagtcggc 2880  
ccctaactcc gcccatttttcc cccctaaactc cggccagttc cggccatttc ccccccatttgc 2940  
gctgactaat ttttttatt tatgcagagg ccgaggccgc ctcggccctt gagctattcc 3000  
agaagtagtg aggaggctt ttggaggcc taggcttttgc caaaaagctt gattttctg 3060  
acacaacagt ctcgaactt aaggctagagc caccatgatt gaacaagatg gattgcacgc 3120  
aggttctccg gcccatttttcc tggagaggctt attcggctat gactggcacc aacagacaat 3180  
cggtctgtct gatgcggccg ttttccggct gtcagcgcag gggcggccgg ttctttttgt 3240  
caagaccgac ctgtccgggtt ccctgaatga actgcaggac gaggcagcgc ggctatcg 3300  
gctggccacg acggggctt cttgcgcagc tttgtgttgc gttgtcactt aagcgggaag 3360  
ggactggctg ctattggcg aagtgcggg gcaggatctc ttgtcatctc accttgcgtcc 3420  
tgccgagaaa gtatcoatca tggctgtatgc aatgcggccg ttgtcatctc ttgtccggc 3480  
tacccgtccca ttgcaccacc aagcgaaaca tgcgcacgc cggacacgtt ctcggatgg 3540  
agccggctt gtcgatcagg atgatcttgc cgaagagcat caggggctcg cccagccg 3600  
actgttgcgc aggctcaagg cgcgcacgc cgcggccgg gatctcgatgc tgaccatgg 3660  
cgatgcgttgc ttgcgttgc aatggccgc ttgttgcgtt tcacgcactt 3720  
tggccggctg ggtgtggccg accgctatca ggacatagcg ttggctaccc gtgtatattgc 3780  
tgaagagctt ggcggcgaat gggctgaccg ctgcgttgc ttgcgttgc ttgcgttgc 3840  
cgatttcgcag cgcacgcctt tcatgcgtt tcttgcgtt gatctcgatgc cggactctg 3900  
gggttcgaaa tgaccgacca agcgacgc aacctgcattt ctcggatggc gcaataaaaat 3960  
atctttatcc tcattacatc tttttgttgc gaaatgcgtt gatgttgcgtt gatgttgc 4020  
ctctcagtac aatctgcgtt gatgcgcac agttaagccca gccccgacac ccgcacac 4080  
ccgctgacgc gcccgttgc gttgtctgc tccggcatc cgcatttgcgaa caagctgtga 4140  
ccgtctccgg gagctgcgtt gttcagaggat ttgcgttgc atcaccggaa cgcgcgagac 4200  
gaaaggccct cgtgatacgc ctatccatc aggttaatgtt catgataata atggtttctt 4260  
agacgtcagg tggcactttt cggggaaatg tgcggggaaac ccctatttgc ttatccatc 4320  
aaatacattt aaatatgtat ccgcgttgc gacaataacc ctgataataat cttcaataat 4380  
atggaaaaaaag gaagagatgtt agtattcaac attccgttgc cgccttattt cccttttttgc 4440  
cgccattttt cttccgtt ttgcgttgc cagaaacgtt ggtggaaatg aaagatgcgtt 4500  
aagatcgtt ggggtgcacgc ttgggttaca tgcgttgc tctcaacagc ggttgcgtt 4560  
ttgagatgtt tgcgttgc aacgcgttgc caatgtatgc cacttttttgc gtttgcgtt 4620  
gtggcgcgggtt attatccgtt gttgcgttgc ggcaagagac actcggttgc cgcacac 4680  
atttctcgtt gacttgcgtt gacttgcgtt cagtcacaga aaagatgcgtt acggatggca 4740  
tgacagtatgc agaattatgc agtgcgttgc ttttgcgttgc ttttgcgttgc 4800  
tacccgttgc aacgcgttgc ggcaagagac agtgcgttgc ttttgcgttgc aacatgggg 4860  
atcatgttgc tgcgttgc ttttgcgttgc ctttgcgttgc ttttgcgttgc 4920  
agcgtgacac cacgttgcgttgc ttttgcgttgc ctttgcgttgc ttttgcgttgc 4980  
aactacttac ttttgcgttgc ctttgcgttgc ttttgcgttgc ttttgcgttgc 5040  
cagggccact ttttgcgttgc ctttgcgttgc ttttgcgttgc ttttgcgttgc 5100  
ccgggttgcgttgc ggttgcgttgc ctttgcgttgc ttttgcgttgc ttttgcgttgc 5160  
gtatcgttgc ttttgcgttgc ctttgcgttgc ttttgcgttgc ttttgcgttgc 5220

tgcgtgagat	aggtgcctca	gattaagc	attggtaact	gtcagaccaa	cttactcat	5280
ataatacttta	gattgattta	aaacttcatt	ttaatttaa	aaggatctag	gtgaagatcc	5340
tttttataaa	tctcatgacc	aaaatccctt	aacgtgagtt	ttcggtccac	tgagcgtcag	5400
acccccgtaga	aaagatcaaa	ggatcttctt	gagatcctt	ttttctgcgc	gtaatctgct	5460
gcttgc当地	aaaaaaacca	ccgctaccag	cggtggttt	tttgc当地	caagagctac	5520
caactctttt	tccgaaggta	actggcttca	gcagagcgc当地	gataccaaat	actgtcccttc	5580
tagttagcc	gtagtttaggc	caccacttca	agaactctgt	agcaccgc当地	acataccctcg	5640
ctctgctaatt	cctgttacca	gtggctgctg	ccagtggega	taagtcgtgt	cttaccgggt	5700
tggactcaag	acgatagttt	ccggataagg	cgccggc当地	gggctgaacg	gggggttctgt	5760
gcacacagcc	cagcttggag	cgaacgacct	acaccgaact	gagataccta	cagcgtgagc	5820
tatgagaaaag	cgccacgctt	cccgaaggga	gaaaggcgga	caggtatccg	gtaaggcgca	5880
gggtc当地	aggagagcgc	acgaggggagc	ttccaggggg	aaacgcctgg	tatcttata	5940
gtcctgtcgg	gttgc当地	ctctgacttg	agcgtc当地	tttgc当地	tcgtcagggg	6000
ggcggagcct	atggaaaaaaac	gccagcaacg	cgccctttt	acggttccctg	gccttttgct	6060
ggcctttgc	tcacatggct	cgac				6084

<210> 8  
<211> 6085  
<212> DNA  
<213> *Homo sapiens*

<400> 8  
agatcttcaa tattggccat tagccatatt attcattggt tatatacgat aaatcaatat 60  
tggctattgg ccattgcata cgtttatct atatcataat atgtacattt atattggctc 120  
atgtccaaa tggaccgccc gttggcattt attattgact agtttataat agtaatcaat 180  
tacggggtca tttagttcata gcccataat ggagttccgc gttacataac ttacggtaaa 240  
tggcccgct ggctgaccgc ccaacgaccc cggcccatgg acgtcaataa tgacgtatgt 300  
tcccatagta acgccaatag ggacttcca ttgacgtcaa tgggtggagt atttacggta 360  
aactgcccac ttggcagttac atcaagtgtt tcataatgcac agtccgcccc ctattgacgt 420  
caatgacggt aaatggcccg cctggcattt tgcccagttac atgacccctac gggactttcc 480  
tacttgcag tacatctacg tattagtcat cgctattacc atgggtatgc gggtttggca 540  
gtacaccaat gggcgtggat agcgggta ctcacgggta tttccaagtc tccacccat 600  
tgacgtcaat gggagtttg tttggcacca aaatcaacgg gactttccaa aatgtcgtaa 660  
caactgcgtat cgcccccccc gttgacgcaa atgggcccgtt ggcgtgtacg gtgggaggtc 720  
tatataagca gagctcgttt agtgaaccgt cagatcacta gaagctttat tgccgttagtt 780  
tatcacagtt aaattgctaa cgcagtcagt gcttctgaca caacagtctc gaacttaagc 840  
tgcagtgtact ctcttaattt actccaccag tctcaatttca gttcccttttgc cctccaccag 900  
tctcaatttca gttcccttttgc catgaagagc tcagaatcaa aagagggaaac caacccctaa 960  
gatgagcttt ccatgttaat ttgttagccag cttccatttgc attttcaatg tttcttccaa 1020  
aggtgcagtc tccaaagaga ttacgaatgc cttggaaacc tgggtgcct tgggtcagga 1080  
catcaacttgc gacatttccat gttttcaat gagtgatgtt attgacgata taaaatggga 1140  
aaaaacttca gacaagaaaa agattgcaca attcagaaaa gagaagaga ctttcaagga 1200  
aaaagatata tataagctat taaaaatgg aactctgaaa attaagcatc tgaagaccga 1260  
tgatcaggat atctacaagg tatcaatata tgatcacaaa gggaaaaatgg tggggaaaa 1320  
aatatttgat ttgaagattt aagaggggt ctcaaaaacca aagatctctt ggacttgtat 1380  
caacacaacc ctgacccgtt aggttaatgaa tggacttgc cccgaattaa acctgtatca 1440  
agatggggaa catctaaaac tttctcagag ggtcatcaca cacaagtggg ccaccagcc 1500  
gagtgcaaaa ttcaagtgc cagcaggaa caaagtccgc aaggaatcca gtgtcgagcc 1560  
tgtcagctgt ccagagaaaag ggatcccagg tgagttagggc ccgttccctc tagagtccgag 1620  
ctctcttaag gtagcaaggat tacaagacag gtttaaggag accaatagaa actgggcttg 1680  
tcgagacaga gaagacttgc gctttctga taggcaccta ttggctttac gggcccgca 1740  
attccaagct ttagtattct atcgtgtcac ctaaataact tggcgtaatc atggtcatat 1800  
ctgtttccgt tggaaatttgc ttatccgc tcaattccac acaacatacg agccggaaagc 1860  
ataaaatgttca aagcctgggg tgcctaatgc gtgagctaac tcacattaaat tgcgttgcgc 1920  
gtatcttca ttttgtgagg gttaatgttttgc cggaaagaca tgataagata cattgtatgag 1980  
tttggacaaa ccacaacaag aatgcgttca aaaaaatgttca ttttgtgttca aatttgcgtat 2040  
gctattgttca ttttgtgttca cattataagc tgcaataaaac aagtttacaa caacaatttgc 2100  
attcatatttca ttttgtcaggat tcaggggggat atgtggggagg ttttttaaag caagtaaaaac 2160

ctctacaaat gtggtaaaat gataagga tcgattccgg agcctgaatg cgaatggac 2220  
gcgcctgt a gggcgcatt a a g c g g c g g g t g t g g t g g t a c g c g a c g t a c g a c 2280  
cacttgcag cgcctagcg cccgctcctt tcgcttctt cccttcctt ctcggcacgt 2340  
tcggcgctt tccccgtcaa gctctaaatc ggggctccc tttagggttc cgatttagt 2400  
cttacggca cctcgacccc aaaaaacttg attagggta tggttcacgt agtggccat 2460  
cgccctgata gacggtttt cgcccttta cggtggagtc cacgttctt aatagtggac 2520  
tcttgttcca aactgaaaca aactcaacc ctatctcggt ctattcttt gatttataag 2580  
ggattttgcc gatttccggcc tattggtaa aaaaatgagct gatthaacaa aaatttaacg 2640  
cgaattttaa caaaatatta acgcttacaa ttgcgcctgt gtaccttcg aggccgaaag 2700  
aaccagctgt ggaatgtgtg tcagtttaggg tggaaagt cccaggctc cccagcaggc 2760  
agaagtatgc aaagcatgca tctcaattag tcagcaacca ggtgtggaaa gtccccaggc 2820  
tccccagcag gcagaagttt gcaaagcatg catctcaatt agtcagcaac catagtccc 2880  
cccctaactc cgcctatccc gcccctaact cgcctcagg tccggccatc 2940  
ggctgactaa tttttttat ttatgcagag gccgaggccg ctcggccctc tgagctattc 3000  
cagaagtagt gaggaggctt ttttggaggc ctaggtttt gaaaaaagct tgattcttct 3060  
gacacaacag tctcgaactt aaggcttagag ccaccatgat tgaacaagat ggattgcacg 3120  
cagttctcc gggcgttgg tggagaggc tattggctta tgactggca caacagacaa 3180  
tcggctgctc tggatgcggcc gtgttccggc tgcagcgca gggcgcccg gtttttttg 3240  
tcaagaccga cctgtccgg tccctgaatg aactgcagga cgaggcagcg cggctatgt 3300  
ggctggccac gacggcggtt cttgcgcag ctgtgcgcga cttgtcaact gaagcgggaa 3360  
gggactggct gctattggc gaagtgcggc ggcaggatct cctgtcatct caccttgc 3420  
ctgcccggaa agtacccatc atggctgatg caatgcggcg gctgcataacg cttgatccgg 3480  
ctacctgccc attcgaccac caagcgaaac atcgcatcg gcgagcactg actcgatgg 3540  
aagccgtct tgcgatcag gatgatctgg acgaagagca tcaggggctc ggcgcaggc 3600  
aactgttcgc caggctcaag ggcgcgcgc gatctcgctc gtgacccatg 3660  
gcgatgcctg cttgcgaat atcatggtgg aaaaatggccg ctttctggta ttcatcgact 3720  
gtggccggct ggggtggcg gaccgcatac aggacatagc gttggctacc cgtatattg 3780  
ctgaagagct tggcgccgaa tggctgacc gttctctgt gctttacggt atgcgcgc 3840  
ccgattcgca ggcgcgcgc ttctatcgcc ttcttgcga gttcttctga gggactct 3900  
ggggttcgaa atgaccgacc aagcgacgc caacctgcca tcacgatggc cgcaataaaa 3960  
tatctttatt ttcattacat ctgtgtgtt gtttttggta tgaagatccg cgtatggtgc 4020  
actctcagta caatctgc tggatgcgc tagttaagcc agccccgaca cccgccaaca 4080  
cccgcgtacg cgcctgacg ggcttgcgt ctccggcat cgccttacag acaagctgt 4140  
accgtctccg ggagctgc tggcagagg ttttcccg catcaccgaa acgcgcgaga 4200  
cgaaaggccc tcgtgatacg cttatTTTA taggttaatg tcatgataat aatgtttct 4260  
tagacgtcag tggcacttt tcggggaaat gtgcggaa cccctatttgc tttatTTTC 4320  
taaatacatt caaatatgtt tccgctcatg agacaataac cctgataat gctcaataa 4380  
tattgaaaaa ggaagagttt gaggattca catttccgtg tcgcccatt tcccttttt 4440  
gcgcatttt gccttcgtt ttttgcac ccagaaacgc tggtaaaagt aaaagatgt 4500  
gaagatcagt tgggtgcacg agtgggttac atcgaactgg atctcaacag cgtaagatc 4560  
cttggaggtt ttcgccccga agaacgtttt ccaatgtga gacttttaa agttctgcta 4620  
tggcggcggtt tattatccc tattgacgc gggcaagagc aactcggtcg cgcatacac 4680  
tattctcaga atgacttgg tggacttca ccagtcacag aaaaagcatct tacggatggc 4740  
atgacagtaa gagaattatg cagtgcgc tcaaccatga gtgataacac tgcggccaac 4800  
ttacttctga caacgatcgg agacccgaa gagcttacccg ctttttgc caacatgggg 4860  
gatcatgtaa ctgccttga tcgttggaa cggagctga atgaagccat accaaacgc 4920  
gagcgtgaca ccacgatgcc tggacttca gcaacaacgt tgcgcacact attaactggc 4980  
gaactactt ctctagctt cccgcaacaa ttaatagact ggtggaggc ggataaagtt 5040  
gcaggaccac ttctgcgc tggccctccg gctggctgg ttattgtca taaatctgga 5100  
gccggtgagc gtgggtctcg cgttatcatt gcagcactgg ggcggatgg taaggccctcc 5160  
cgtatcgtag ttatctacac gacggggagt caggcaacta tggatgaacg aaatagacag 5220  
atcgctgaga taggtgcctc actgatggaa cattgttaac tgcagacca agttactca 5280  
tatatacttt agattgattt aaaaacttcat ttttaattt aaggatcta ggtgaagatc 5340  
ctttttgata atctcatgac caaaatccct taacgtgagt ttgcgttcca ctgagcgtca 5400  
gacccctgt aaaaagatcaa agatcttct tgagatcctt ttttctgcg cgtaatctgc 5460  
tgcttgcataa caaaaaacc accgctacca ggggtggttt gtttgcggta tcaagagct 5520  
ccaactctt ttccgaaggt aactggcttc agcagagcgc agataccaa tactgtcctt 5580  
ctagtgttagc cgtagttagg ccaccacttc aagaactctg tagcaccggc tacatacctc 5640  
gctctgctaa tcctgttacc agtggctgct ggcagtgccg ataaatcgatc tcttaccggg 5700

ttggactcaa gacgatagtt cggtataag gcgcagcggt cgggctgaac ggggggttcg 5760  
tgcacacago ccagcttgg a gcaacgacc tacaccgaac tgagataacct acagcgtag 5820  
ctatgagaaa ggcacacgct tcccaagg agaaaggcg acaggtatcc ggttaagcgcc 5880  
agggtcgaa caggagagcg cacgagggag cttccaggaa gaaacgcctg gtatctt 5940  
agtccctgtcg gtttgcctt cctctgactt gagcgtcgat ttttgtatg ctcgtcagg 6000  
ggccggagcc tatggaaaaa cgccagcaac gcggccttt tacggttctt ggcctttgc 6060  
tggcccttttgc ttcacatggc tcgac 6085

<210> 9  
<211> 6086  
<212> DNA  
<213> Homo sapiens

<400> 9  
agatcttcaa tattggccat tagccatatt attcatttgt tatatagoat aaatcaat 60  
tggctattgg ccattgcata cgttatct atatcataat atgtacattt atattggctc 120  
atgtccata tgaccggcat gttggcattt attattgact agttattaaat agtaatcaat 180  
tacggggtca ttatgtccata gcccataat ggagttccgc gttacataac ttacggtaaa 240  
tggcccgctt ggctgaccgc ccaacgacc ccccccattt acgtcaataa tgacgtatgt 300  
tcccatagta acgccaatag ggactttcca ttgaogtcaa tgggtggagt atttacggta 360  
aactgcccac ttggcagttt atcaagtgtt tcatatgcca agtccgcccc ctattgacgt 420  
caatgacggt aaatggcccg cctggcatta tgcccaogtac atgaccttac gggactttcc 480  
tacttggcag tacatctacg tatttgtcat cgctattacc atgggtatgc ggttttggca 540  
gtacaccaat gggcgtggat agcggtttga ctcacgggaa tttccaagtc tccaccccat 600  
tgacgtcaat gggagtttgc ttggcacca aaatcaacgg gactttccaa aatgtcgtaa 660  
caactgcat ccccccccccc gttgacgcaa atggcggta ggcgtgtacg gtgggaggc 720  
tatataagca gagctcgaaa agtgaaccgt cagatcacta gaagctttat tgccgttagtt 780  
tatcacagtt aaattgtcaa cgcagtcgt gcttcgtaca caacagtctc gaacttaagc 840  
tgcagtgact ctcttaatta actccaccag tctcacttca gttccttttgc cctccaccag 900  
tctcaacttca gttccttttgc catgaagagc tcagaatcaa aagagggaaac caacccctaa 960  
gatgagctt ccatgttaat tttagccag cttccctctg attttcaatg tttttccaa 1020  
aggtgcagtc tccaaagaga ttacgaatgc cttggaaacc tgggtgcct tgggtcagga 1080  
catcaacttgc gacatttccat gtttcaatg gagtgcgtat attgacgata taaaatggga 1140  
aaaaacttca gacaagaaaa agattgcaca attcagaaaa gagaagagaa ctttcaagga 1200  
aaaagatata tataagctat ttttttttttgc aactctgaaa attaagcatc tgaagaccga 1260  
tgatcaggat atctacaagg tatcaatata tgatcataaaa gaaaaatggat tttttggaaaa 1320  
aatatttgcattt ttaaaggattc aagaggggt ctcaaaacca aagatctcct ggacttgc 1380  
caacacaacc ctgacccgtg agtaatgaa tggaaactgac cccgaattaa acctgtatca 1440  
agatggggaaa catctaaaac ttctcagag ggtcatcaca cacaagtggc ccaccagcct 1500  
gagtgcaaaa ttcaagtgc cagcaggaa caaagtgc aaggaatcca gtgtcgagcc 1560  
tgtcagctgt ccagagaaag ggttccacag gtgagtaggg cccgatcctt ctagagtcga 1620  
gctctcttaa ggttagcaagg ttacaagaca gtttaagga gaccaataga aactggctt 1680  
gtcgagacag agaagactct tgcgtttctg ataggcacctt atgggtctt cgcggccgc 1740  
aattccaaatc tttagtatttca ttcgtgtca cttaaataac ttggcgtaat catgtcata 1800  
tctgtttccat gttgttaattt gttatccgt cacaatttca cacaacatac gagccggaa 1860  
cataaaatgtt aaaggctggg gtccttaatg agtgcgttca ctcacattaa ttgcgttgc 1920  
cgatgtttccat tttttgttag gtttaatgtc tgcgttgc acatgtatgc atggatgtca 1980  
gtttggacaa accacaacaa gaatgcgtt gaaaaatgc tttttttgtt aatattgtga 2040  
tgctattgtt ttatgttcaatc ctttttttttca ctttttttttca ctttttttttca 2100  
cattcattttt atgtttcagg ttcagggggg gatgtggggat gtttttttttca gcaagtttttttttca 2160  
cctctacaaa ttttttttttca ttcgttgcgttca ttcgttgcgttca ttcgttgcgttca 2220  
cgcccccgtt agcggccgtt taagcgcggc ggggtgggtt gttacgcgttca ctttttttttca 2280  
acacccgttccat ggcggccgtt ctttttttttca ttcgttgcgttca ttcgttgcgttca 2340  
ttcgccggct ttttttttttca agtgcgttcaatc ctttttttttca ttcgttgcgttca ttcgttgcgttca 2400  
gctttacggc acctcgaccc caaaaaactt gtttttttttca ttcgttgcgttca ttcgttgcgttca 2460  
tcggccctgtt agacgggttt ttcgttgcgttca ttcgttgcgttca ttcgttgcgttca 2520  
ctcttgcgttcc aatgttgcgttca ttcgttgcgttca ttcgttgcgttca ttcgttgcgttca 2580  
gggattttgc ctttttttttca ttcgttgcgttca ttcgttgcgttca ttcgttgcgttca 2640

gcgaatttta acaaaatatt cgcttaca atttcgcctg tgtaccttctt gaggcgaaaa 2700  
gaaccagctg tggaatgtgt gtcagtagg gtgtggaaag tccccaggct cccccagg 2760  
cagaagtatg caaagcatgc atctcaatta gtcagcaacc aggtgtggaa agtccccagg 2820  
ctccccagca ggcagaagta tgcaaagcat gcatctcaat tagtcagcaa ccatagtccc 2880  
gcccctaact cggcccatcc cgccccatac tccgcccagt tccgcccatt ctccgcccc 2940  
tggctgacta attttttta tttatgcaga ggccgaggcc gcctcggcct ctgagctatt 3000  
ccagaagtag tgaggaggct ttttggagg cctaggctt tgaaaaaagc ttgattcttc 3060  
tgacacaaca gtctgaact taaggctaga gccaccatga ttgaacaaga tggattgcac 3120  
gcaggttctc cggccgctt ggtggagagg ctattcgct atgactggc acaacagaca 3180  
atcggctgct ctgatgcccgc cgtgttccgg ctgtcagcgc agggggcgcgg ggttctttt 3240  
gtcaagaccg acctgtccgg tgccctgaat gaactgcagg acgaggcagc gcggctatcg 3300  
tggctggcca cgacggcgt tccttgcga gctgtgctcg acgttgcac tgaagcggga 3360  
aggactggc tgctattggg cgaagtgcgg gggcaggatc tcctgtcatc tcaccttgc 3420  
cctggcgaga aagtatccat catggctgat gcaatgcggc ggctgcatac gcttgatccg 3480  
gctacctgcc cattcgacca ccaagcgaaa catcgcatcg agcgagcacg tactcgatg 3540  
gaagccggtc ttgtcgatca ggatgatctg gacgaagagc atcaggggct cgcgccagcc 3600  
gaactgttcg ccaggctcaa ggccgcgcatg cccgcacggcg aggtatctgt cgtgaccat 3660  
ggcgatgcct gcttgcgaa tatcatgggt gaaaatggcc gttttctgg attcatcgac 3720  
tgtggccggc tgggtgtggc ggaccgctat caggacatag cggtggctac ccgtgatatt 3780  
gctgaagagc ttggcggcga atgggctgac cgcttctcg tgctttacgg tateggcgt 3840  
cccgattcgc agcgcatcgc ctctatcgc cttcttgacg agttcttctg agcgggactc 3900  
tggggttcga aatgaccgac caagcgacgc ccaacctgcc atcacgatgg ccgaataaaa 3960  
atatcttat tttcattaca tctgtgtgtt gttttttgt gtgaagatcc gcgtatggtg 4020  
caactctcgt acaatotgtc ctgatgcgcgc atagttaaac cagccccgac acccgccaac 4080  
acccgctgac ggcgcctgac gggcttgcgc gctccggca tccgcttaca gacaagctgt 4140  
gaccgtctcc gggagctgca tgggtcagag gtttccaccg tcatcaccga aacgcgcgag 4200  
acgaaagggc ctgcgtatac gcctatttt atagttaaat gtcataaaata taatggttc 4260  
tttagacgtca ggtggcactt ttccggggaaa tgggtcgccgaa accccctattt gttttttttt 4320  
ctaaatacat tcaaataatgt atccgctcat gagacaataa ccctgataaa tgctcaata 4380  
atattgaaaa aggaagagta tgggttccgt acatttcgt gtcgcctta ttccctttt 4440  
tgccgcattt tgccttcctg ttttgcga cccagaaaacg ctgggtgaaag taaaagatgc 4500  
tgaagatcag ttgggtgcac gagggttta catcgaaactg gatctcaaca gcggtaagat 4560  
cctttagagtttttgcgc aagaacgttt tccatgatg agcacttttta aagttctgt 4620  
atgtggcgcg gtattatccc gtatttgacgc cggcaagag caactcggtc gcccataca 4680  
ctattctcag aatgacttgg ttggacttc accagtcaca gaaaagcatc ttacggatgg 4740  
catgacagta agagaattat gcagtgctgc cataaccatg agtgcataaca ctgcggccaa 4800  
cttacttcgt acaacgatcg gaggaccgaa ggagctaacc gctttttgc acaacatggg 4860  
ggatcatgta actcgccctt atcggtggg accggagctg aatgaagcca taccaaacga 4920  
cgagcgtgac accacgatgc ctgttagcaat ggcaacaacg ttgcgcacaac tattaactgg 4980  
cgaactactt actctagtt cccggcaaca attaatacgat tggatggagg cgataaaagt 5040  
tgcaggacca cttctgcgc cggcccttcc ggctggctgg tttattgcgt ataaatctgg 5100  
agccggtagt cgtgggtctc ggggtatcat tgcagcactg gggccagatg gtaagccctc 5160  
ccgtatcgta gttatctaca cgacggggag tcaggcaact atggatgaac gaaatagaca 5220  
gatcgctgag atagggtcct cactgattaa gcattggtaa ctgtcagacc aagtttactc 5280  
atataactt tagattgatt taaaacttca ttttaattt aaaaggatct aggtgaagat 5340  
ccttttgcattt aatctcatga cccaaaatccc ttaacgtgag ttttcgttcc actgagcgtc 5400  
agaccccgta gaaaagatca aaggatctt ttgagatcct tttttctgc gcgtaatctg 5460  
ctgcttgcacca aaaaaaaaaac caccgctacc agcgggtggtt tggggccgg atcaagagct 5520  
accaacttcc tttccgaagg taactggctt cagcagagcg cagataccaa atactgtcct 5580  
tctagtgttag cgtaggttag gcaccactt caagaactct gtagcaccgc ctacataacct 5640  
cgctctgcta atcctgttac cagtggctgc tgccagtgcc gataagtctg gtcttaccgg 5700  
gttggactca agacgatagt taccggataa ggcgcagcgg tcgggctgaa cgggggggttc 5760  
gtgcacacag cccagcttgg agcgaacgcac ctacaccgaa ctgagataacc tacagcgtga 5820  
gctatgagaa agcgccacgc tttccgaagg gagaaggcg gacaggttac cggtaaagcgg 5880  
cagggtcgga acaggagagc gcacgaggga gcttccagg gaaacgcct ggtatcttta 5940  
tagtcctgtc gggtttcgccc acctctgact tgagcgtcga ttttgcgtat gctcgtcagg 6000  
ggggcggagc ctatggaaaa acggccagcaa cgccgcctt ttacgggttcc tggcctttt 6060  
ctggcctttt gctcacatgg ctcgac 6086

<210> 10  
<211> 38  
<212> DNA  
<213> Artificial Sequence

<220>  
<221> modified\_base  
<222> (29)..(32)  
<223> a, c, t, g, other or unknown

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 10  
ttttttttt ttcgtcagcg gccgcacnn nnnttatt 38

<210> 11  
<211> 25  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 11  
cagatcacta gaagctttat tgcgg 25

<210> 12  
<211> 20  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 12  
tttcgtcag cggccgcac 20

<210> 13  
<211> 45  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 13  
actcataggc catagaggcc tatcacagtt aaattgctaa cgcag 45

<210> 14

<211> 43  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic oligonucleotide

<400> 14  
ctcgtttagt gcggccgctc agatcactga attctgacga cct 43

<210> 15  
<211> 41  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic oligonucleotide

<400> 15  
ctcgtttagt ggcgccag atcactgaat tctgacgacc t 41

<210> 16  
<211> 22  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic oligonucleotide

<400> 16  
gacctactga ttaacggcca ta 22

<210> 17  
<211> 20  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic oligonucleotide

<400> 17  
tcgtcagaat tcagtgatct 20

<210> 18  
<211> 6836  
<212> DNA  
<213> Homo sapiens

<400> 18  
agatcttcaa tattggccat tagccatatt attcattggt tatatacgat aaatcaatat 60  
tggctattgg ccattgcata cgttgtatct atatcataat atgtacatctt atattggctc 120



tccgcccagt tccgcccattccgccccca tggctgacta attttttttta cttatgcaga 3720  
ggccgaggcc gcctcgccct ctgagctatt ccagaagtag tgaggaggct tttttggagg 3780  
cctaggctt tgcaaaaagc ttgattcttc tgacacaaca gtctgaact taaggctaga 3840  
gccaccatga ttgaacaaga tggattgcac gcaggcttc cggccgctt ggtggagagg 3900  
ctattcgct atgactggc acaacagaca atcggtcgct ctgatgccgc cgtgttccgg 3960  
ctgtcagcgc agggggcccc ggttctttt gtcaagaccg acctgtccgg tgcctgaat 4020  
gaactgcagg acgaggcage gcggctatcg tggctggcca cgacgggcgt tcctgcgca 4080  
gctgtgctcg acgttgcac tgaagcggga agggactggc tgctattggg cgaagtgcgg 4140  
gggcaggatc tcctgtcata tcaccttgcct cctgcccaga aagtatccat catggctgat 4200  
gcaatgcggc ggctgcatac gcttgcatacg gctacctgccc cattcgacca ccaagcgaaa 4260  
catcgcatcg agcgagcagc tactcgatg gaagccggc tttgtcgatca ggatgtatcg 4320  
gacgaagagc atcaggggct cgccgcagcc gaactgttcg ccaggctcaa ggcgcgcatg 4380  
ccgcacggcg aggatctcg tctgacccat ggctgatgcct gcttgcggaa tatcatggtg 4440  
gaaaatggcc gctttctgg attcatcgac tggccggc tgggtgtggc ggaccgctat 4500  
caggacatag ctgtggctac ccgtgatatt gctgaagagc ttggccggcga atgggctgac 4560  
cggttcctcg tgcttacgg tatcgccgct cccgattcgc agcgcatcgc cttctatcgc 4620  
cttcttgacg agttcttctg agcgggactc tgggttgcg aatgaccgac caagcgacgc 4680  
ccaaacctgcc atcacgatgg ccgcaataaaa atatctttat tttcattaca tctgtgtt 4740  
ggtttttgt gtgaagatcc gctgtatggc cactctcgt acaatctgct ctgatgcgc 4800  
atagttaaac cagccccgac acccgccaaac acccgctgac ggcgcctgac gggcttgc 4860  
gctccggca tccgcttaca gacaagctgt gaccgtctcc gggagctgca tgggttgc 4920  
gttttacccg tcataccga aacgcgcgag acgaaaggc ctcgtgatc gcctatccc 4980  
ataggtaat gtcatacataa taatggtttcc ttagacgtca ggtggcactt ttggggaaa 5040  
tgtgcgcgga acccctattt gtttattttt ctaaatacat tcaaataatgt atccgctcat 5100  
gagacaataa ccctgataaa tgcttcaata atattgaaaa aggaagagta tgagtattca 5160  
acatttcgt gtcgcctta ttccctttt tgcggcattt tgccttcctg ttttgctca 5220  
cccaagaaacg ctggtaaaag taaaagatgc tgaagatcag ttgggtgcac ggtgggtt 5280  
catcgaaactg gatctaaaca gcggttaagat ctttgcggat tttcgccccg aagaacgtt 5340  
tccaatgatg agcaattttt aagttctgct atgtggcgcg gtattatccc gtattgacgc 5400  
cgggcaagag caactcggtc gcccataca ctatttcag aatgacttgg ttgagtactc 5460  
accagtccaca gaaaaggcattt ttacggatgg catgacagta agagaattat gcagtgc 5520  
cataaccatg agtataaca ctgcggccaa cttacttctg acaacgatcg gaggaccgaa 5580  
ggagctaacc gctttttgc acaacatggg ggatcatgt aactgccttgc atcggtgg 5640  
accggagctg aatgaagcca taccacaaacg cggcgtgac accacgatgc ctgttagcaat 5700  
ggcaacaacg ttgcgcaaaac tattaactgg cgaactactt actctagctt cccggcaaca 5760  
attaatagac tggatggagg cggataaaagt tgcaggacca cttctgcgtt cggcccttcc 5820  
ggctggctgg tttatttgcataaaatctgg agccgggtgag cgtgggttgc gcggtatcat 5880  
tgcagcactg gggccagatg gtaagccctc ccgtatcgta gttatctaca cgacggggag 5940  
tcaggcaact atggatgaac gaaatagaca gatcgctgag ataggctgcactt cactgattaa 6000  
gcattggtaa ctgtcagacc aagtttactc atatataactt tagattgatt taaaacttca 6060  
tttttaattt aaaaggatct aggtgaagat ctttttgcattt aatctcatga cccaaatccc 6120  
ttaacgtgag ttttcgttcc actgagcgtc agacccgtt gaaaagatca aaggatctt 6180  
ttgagatcct ttttttgcgtt gcttaatctg ctgctgcattt aaaaaaaaaac caccgcattt 6240  
agcggtgggtt tttttggggg atcaagagctt accaactt cttccggatgg taaactggctt 6300  
cagcagagcg cagataccaa atactgtccct tctatgttgcgtt ccgtatgttgc gcccaccattt 6360  
caagaactctt gtagcaccgc ctacataccct cgctcgatcc atctgttgcgtt cagttggctgc 6420  
tgccatgtggc gataagtgcgt gtcttaccgg gttggactca agacgatgtt taccggatgg 6480  
ggccgcagcgg tcgggctgaa cgggggggttc gtgcacacag cccagcttgg agcgaacgc 6540  
ctacacccaa ctgagataacc tacagcgtga gctatgagaa agcgcacacgc ttccggaaagg 6600  
gagaaaaggcgc gacaggttac cggtaagcgg cagggtcgga acaggagagc gcacggagg 6660  
gcttccaggg ggaaacgcctt ggtatcttta tagtctgtc ggggttgcac acctctgact 6720  
tgagcgtcga tttttgtgtt gtcgtcagg gggggggggcctt atatggaaaa acgcccacaa 6780  
cgccggccctt ttacgggttcc tggccctttt ctggcattttt gtcacatgg ctcgcac 6836

<210> 19  
<211> 4644  
<212> DNA  
<213> Homo sapiens

<400> 19

gatcttcaat attggccatt agccatatta ttcattgggtt atatacgata aatcaatatt 60  
ggcttattggc cattgcatac gttgtatcta tatacataata tgtacattt tattggctca 120  
tgtccaatat gaccggccatg ttggcattga ttattgacta gttattataata gtaatcaatt 180  
acgggggtcat tagttcatag cccatataatg gagttcccggtt acataact tacggtaat 240  
ggcccgccctg gctgaccgc caacgacccc cggccattga cgtcaataat gacgtatgtt 300  
cccatagtaa cgccaatagg gacttccat tgacgtcaat gggtgagta ttacggtaa 360  
actgcccact tgcagttaca tcaagttatg catatgccaa gtccggcccc tattgacgtc 420  
aatgacggtt aatggccgc ctggcattat' gcccagtaca tgaccttacg ggactttct 480  
acttggcagt acatctacgt attagtcacg gctattacca tggtgatgcg gttttggcag 540  
tacaccaatg ggcgtggata gcggtttgac tcacggggat ttcaagttct ccacccatt 600  
gacgtcaatg ggagttgtt ttggcaccaa aatcaacggg actttccaaa atgtcgtaac 660  
aactgcgatc gcccggcccc ttgacgcaaa tggggcggtag gcgtgtacgg tgggagggtct 720  
atataagcag agtcgttta gtgaaccgtc agatcactga attctgacga cctactgatt 780  
aacggccata gaggectctt gcagatcaat agaagcttta ttgcggtagt ttatcacagt 840  
taaattgcta acgcagtcag tgcttctgac acaacagttct cgaacttaag ctgcagtgac 900  
tctcttaaat ccaccatggc tacaggttag tactcgctac cttaaagagag gcctatctgg 960  
ccagttagca gtcgaagaaa gaagtttaag agagccgaaa caagcgctca tgagccgaa 1020  
gtggcgagcc cgatcttccc catcggtat gtcggcgata taggcggccag caaccgcacc 1080  
tgtggcgccg gtatgcccgg ccacgatgctg tccggcgtag aggttccaca ggacgggtgt 1140  
ggtcgcctatg attcgcgtatg cgataagtggc tccaagtagc gaagcgagca ggactggcgc 1200  
gcccggccaaag cggtcgac gtgctccggag aacgggtgcg catagaaatt gcatcaacgc 1260  
atatacgctt agatccttgc tagagtcgag atctgtcgag ccatgtgagc aaaaggccag 1320  
caaaaaggcca ggaaccgtaa aaaggccgcg ttgctggcgt ttttcatag gtcggcccc 1380  
cctgacgagc atcacaaaaaa tcgacgctca agtcagaggt ggcgaaaccc gacaggacta 1440  
taaagatacc agcggttcc ccctgaagc tccctcggtc gctctcctgt tccgacccctg 1500  
ccgcttaccg gatacctgtc cgccttctc ctttcggaa gcgtggcgct ttctcatagc 1560  
tcacgcgtta ggtatctcag ttccggtagt gtcgttcgtc ccaagctggg ctgtgtgcac 1620  
gaaccccccgg ttcagccccg ccgctcgcc ttatccggta actatcgctc tgagtccaaac 1680  
ccggtaaagac acgacttatac gccactggca gcagccactg gtaacaggat tagcagagcg 1740  
aggtatgttag gccgtgtac agagtcttgc aagtgggtgc ctaactacgg ctacactaga 1800  
aggacagtat ttgttatctg cgctctgctg aagccagttt ctttcggaaa aagagtgg 1860  
agctctgtat cccgcaaaaca aaccaccgtt gtagccgtt gttttttgt ttgcaagcag 1920  
cagattacgc gcagaaaaaaa aggatctcaa gaagatccct tgatctttc tacgggtct 1980  
gacgctcgtt ggaacgaaaaa ctcacgtttaa gggatttgg tcatgagatt atcaaaaaagg 2040  
atcttcaccc agatcctttt atcgggtgtat aataccgcac agatcgtaa ggagaaaata 2100  
ccgcacatcagg aaattgttaag cgttaataat tcagaagaac tcgtaagaa ggcgatagaa 2160  
ggcgatgcgc tgcaatcg gagcggcgat accgtaaagc acgaggaagc ggtcagccca 2220  
ttccggcca agtcgttccatg caatatcact gtagccaaac gctatgtcct gatagcggtc 2280  
cgccacaccc agccggccac agtcgtatgaa tccagaaaaag cggccatttt ccaccatgat 2340  
attcggcaag caggcatcgc catgggtcac gacgagatcc tcgcccgtcgg gcatgctcgc 2400  
cttgaggctg gcaacagttt cggctggcgat gagccctgtg tgctcttgcg ccagatcata 2460  
ctgatcgaca agacccggctt ccacatccgtt acgtgtctcg tcgatcgat gtttcgcttg 2520  
gtgggtcaat gggcaggtag cggatcaag cgtatgcagc cggccatttg catcagccat 2580  
gatggatact ttctcgccag gagcaaggtg agatgacagg agatcctgccc cccggacttc 2640  
gcccaatagc agccagttcc ttcccgttc agtgacaaacg tcgagcacag ctgcgcaagg 2700  
aacgccccgtc gtggccagcc acgatagccg cgctgcctcg tcttgcgtt cattcagggc 2760  
accggacagg tcggcttgc caaaaagaac cggggcccc tcgctgaca gccggaacac 2820  
ggcggcatca gagcagccga ttgtctgttgc tgcccgatca tagcgaata gcctctccac 2880  
ccaagcgccg ggagaacacctg cgtcaatcc atcttgcgttca atcatcgaa acgatcctca 2940  
tcctgtctct ttagtgcgttgc ttgatccctt ggcggatcaat gtcgttgcg gcgagaaagc 3000  
catccagttt actttgcagg gcttgcgttca cttaccagat aaaagtgtc atcattggaa 3060  
aacgttcaat tctgaggcgaa aagaaccag ctgtggatg tgcgttgcgtt aggggtgtgaa 3120  
aagtccccag gctccccccatg aggccagaatg atgcaaaagca tgcatctcaat tttagtgc 3180  
accaggtgtg gaaagtccccccatg aggctccca gcaggccagaa gtatgcggaa catgcacatctc 3240  
aattagtcag caaccatagt cccgccccctt actccggccca tcccggcccc aactccggccc 3300  
agttccgcccc attctccgc ccatgcgttca ctaattttt ttattatgc gcttttttgg agaggccgag 3360  
ggccgctcgg cctctgagctt attccagaag tagtgaggag gcttttttgg aggccttaggc 3420

ttttgcaaaa	agcttgattc	c	tgacaca	acagtctcg	a	cttaaggct	gagccacca	3480
tgattgaaca	agatggattg	cacgcaggtt	ctccggccgc	ttgggtggag	aggctattcg	3540		
gctatgactg	ggcacaca	acaatcggt	gctctgatgc	cgccgtgtc	cggtgtcag	3600		
cgcaggggcg	cccggttctt	tttgcaga	ccgacctgtc	cggtgcctg	aatgaactgc	3660		
aggacgaggc	agcgcgct	tctggctgg	ccacgacggg	cgttcttgc	gcagctgtgc	3720		
tcgacgttgt	cactgaagcg	ggaagggact	ggctgttatt	ggcgaagtg	ccggggcagg	3780		
atctcctgtc	atctcacctt	gctcctgccc	agaaagtatc	catcatggct	gatgcaatgc	3840		
ggcggctgca	tacgcttgat	ccggctaccc	gccattcg	ccaccaagcg	aaacatcgca	3900		
tcgagcgagc	acgtactcg	atggaagccg	gtcttgcga	tcaggatgt	ctggacgaag	3960		
agcatcaggg	gctcgccca	gccgaactgt	tcgccaggct	caaggcgcgc	atgcccgcac	4020		
gcgaggatct	cgtcgtgacc	catggcgat	cctgcttgc	aatatcatg	gtggaaaatg	4080		
gccgctttc	tggattcatc	gactgtggcc	ggctgggtgt	gcccggaccgc	tatcaggaca	4140		
tagcgttggc	tacccgtat	attgctgaag	agcttggcg	cgaaatggct	gaccgcttcc	4200		
tcgtgcttta	cgttacgccc	gctcccgatt	cgcagcgcat	cgcccttctat	cgcccttcttgc	4260		
acgagccatt	ctgatggagg	tagcggccgc	taacctggtt	gctgactaat	tgagatgcac	4320		
gcttgcata	cttctgcctg	ctggggagcc	tgggacttt	ccacaccctt	actgacacac	4380		
attccacagc	tggttcttcc	cgccctcagaa	ggtacacagg	cgaaattgtt	agcgttaata	4440		
tttggtaaa	attcgcgtt	aattttgtt	aaatcagctc	attttttaac	caataggccg	4500		
aaatcggcaa	aatcccttat	aaatcaaaag	aatagaccga	gatagggtt	agtgttgc	4560		
cagtttgaa	caagagtcca	ctattaaaga	acgtggactc	caacgtcaaa	ggcgaaaaaa	4620		
ccgtctatca	ggcgatggc	ccac				4644		

<210> 20  
 <211> 5247  
 <212> DNA  
 <213> Homo sapiens

<400> 20						
gatcttcaat	attggccatt	agccatatta	ttcattggtt	atatagcata	aatcaatatt	60
ggcttattggc	cattgcatac	gttgtatcta	tatcataata	tgtacattt	tattggctca	120
tgtccaatat	gaccgcatt	ttggcattga	ttattgacta	gttattaata	gtaatcaatt	180
acgggggtcat	tagtcata	cccatatatg	gagttccgcg	ttacataact	tacgtaat	240
ggcccgccctg	gctgaccgccc	caacgacccc	cgcccattga	cgtcaataat	gacgtatgtt	300
cccatagtaa	cggcaatagg	gacttccat	tgacgtcaat	gggtggagta	tttacggtaa	360
actgcccact	tggcagta	tcaagtgtat	catatgcca	gtccgcccc	tattgacgtc	420
aatgacggta	aatggcccgc	ctggcattat	gcccagtaca	tgacctta	ggactttct	480
acttggcagt	acatctacgt	attagtcatc	gctattacca	ttgtgtatgc	gttttggcag	540
tacaccaatg	ggcgtggata	gccccgttgc	tcacggggat	ttccaagtct	ccacccatt	600
gacgtcaatg	ggagttgtt	ttggcacca	aatcaacggg	actttccaaa	atgtcgtaac	660
aactgcgatc	gcccccccc	ttgacgc	tggccgttag	gcgtgtacgg	tggaggtct	720
atataagcag	agctcggtt	gtgaaccgtc	agatcaactag	aagctttatt	gccccgtt	780
atcacagtt	aattgc	acgtcagtg	cttctgacac	aacagtctcg	aacttaagct	840
gcagtgactc	tcttaatcc	accatggcta	caggtgagta	ctcgctac	taagagaggc	900
ctatctggcc	agttagcagt	cgaagaaaga	agtttaagag	agccgaaaca	agcgtcatg	960
agcccaagt	ggcgcccc	atcttcccc	tcgggtatgt	ccggcgatata	ggcccgagca	1020
accgcacctg	tggcgccgg	gatgcccggc	acgatgcgtc	ccggcgtagag	gatccacagg	1080
acgggtgtgg	tcgccatgt	cgcgtatgc	atagtggtc	caagtagcga	agcgagcagg	1140
actggggccgc	ggccaaagcg	gtcggacagt	gctccgagaa	ccgggtgcgc	tagaaattgc	1200
atcaacgcac	atagcgtat	atccttgct	gagtcgagat	ctgtcgagcc	atgtgagcaa	1260
aaggccagca	aaaggccagg	aaccgtaaaa	aggccgcgtt	gctggcg	ttccataggc	1320
tccccccccc	tgacgacat	cacaaaaatc	gacgc	tcaaggggtt	cgaaacccga	1380
caggactata	aagataccag	gcgttcccc	ctgaaagctc	cctcgtgc	tctctgttgc	1440
cgaccctgccc	gcttaccgg	tacctgtcc	ccttctccc	ttcggaa	gtggcgctt	1500
ctcatagctc	acgctgttag	tatctcagtt	cggtgttagt	cggtcgctt	aagctgggt	1560
gtgtgcacga	accccccgtt	cagcccgacc	gctgcgc	tttgcgtt	atccggtaac	1620
agtccaaaccc	ggtaa	gac	ttatgc	ca	ctgtgc	1680
gcagagcgag	gtatgttag	ggtgctacag	agttctgaa	gtgggtggc	aactacggct	1740
acactagaag	gac	gtatctgc	gg	ccagttacc	ttcgaaaaaa	1800

gagttggtag ctcttgcattcc caaacaaaa ccacccgtgg tagcgggtgg 1860  
gcaagcagca gattacgcgc agaaaaaaaag gatctcaaga agatccttg atctttct 1920  
cggggtctga cgctcagtgg aacgaaaact cacgttaagg gatttggc atgagattat 1980  
caaaaaggat cttcacctag atccctttat cggtgtgaaa taccgcacag atgogtaagg 2040  
agaaaatacc gcatcaggaa attgtaaagcg ttaataattc agaagaactc gtcaagaagg 2100  
cgatagaagg cgatgcgcg cgaatcgaaa gcggcgatc cgtaaagcac gaggaagcgg 2160  
tcagcccatt cgccgccaag ctcttcagca atatcacggg tagccaaacgc tatgtcctga 2220  
tagcggtccg ccacacccag cggccacag tcgatgaatc cagaaaagcg gccatttcc 2280  
accatgatc tcggcaagca ggcacatcgcc tgggtcacga cgagatccgc gccgtcggc 2340  
atgctcgct tgagcctggc gaacagttcg gctggcgca gcccctgtat ctctcgtcc 2400  
agatcatcct gatcgacaag accggcttc atccgagttac gtgctcgctc gatgcgtgt 2460  
ttcgcttggt ggtcgaatgg gcaggttagcc ggatcaagcg tatgcagccg cgcattgca 2520  
tcagccatga tggatacttt ctccggcaggaa gcaaggtgag atgacaggag atccctgccc 2580  
ggcaacttcgc ccaatagcag ccagtcctt cccgcttcag tgacaacgtc gagcacagct 2640  
gccaaggaa cgccccgtg gcccagccac gatagccgc ctgcctcgctt tgcaagttca 2700  
ttcaggggcac cggacaggc ggtcttgaca aaaagaaccg ggcgcggc cgtcgacagc 2760  
cggaacacgg cggcatcaga gcagccgatt gtctgttg cccagtcata gccgaatagc 2820  
ctctccaccc aagcggccgg agaacctgcg tgcaatccat ttgttcaat catcgaaac 2880  
gatcctcatc ctgtctttt atcagagctt gatccctgc gccatcagat ctttggcggc 2940  
gagaaagcca tccagttac ttgcaggggc ttgtcaaccc taccagataa aagtgtctcat 3000  
cattggaaaa cgttcaattc tgaggcggaa agaacccagct gtggaatgtg tgtcaagttag 3060  
ggtgtggaaa gtcccccaggc tccccagcag gcagaagttat gcaaagcatg catctcaatt 3120  
agtcagcaac caggtgtgga aagtccccag gctcccccagc aggcagaagt atgcaaaagca 3180  
tgcatctcaa ttagtcagca accatagtcg cgcggccatc tccggccatc cgcggccctaa 3240  
ctccgcccag ttccgccccat tcccgccccat atggctgact aattttttt atttatgcag 3300  
aggccgagggc cgcctcggcc tctgagctat tccagaagta gtgaggaggc tttttggag 3360  
gcctaggctt ttgcaaaaag cttgattctt ctgacacaac agtctcgaa ttaaggctag 3420  
agccaccatg attgaacaag atggattgcg cgcagggttcc cggccgcgtt gggggagag 3480  
gctattcggc tatgactggg cacaacagac aatcgctgc tctgatgcgc cctgttccg 3540  
gctgtcagcg cagggcgcc cggttcttt tgcagttttt gacctgtccg gtgcctgaa 3600  
tgaactgcag gacgaggcag cgcggctatc gtggctggcc acgacggggc ttccttcgc 3660  
agctgtctc gacgttgtca ctgaagcggg aaggactgg ctgttattgg gcgaagtgc 3720  
ggggcaggat ctccctgtcat ctcacccctgc tcctgcccgg aaagtatcca tcatggctga 3780  
tgcaatgcgg cggctgcata cgcttgatcc ggctacctgc ccattcgacc accaagcgaa 3840  
acatcgcatc gagcgagcac gtactcggtt ggaaggccggc ttgtcgatc aggatgatct 3900  
ggacgaagag catcaggggc tcgcgcgcgc cgaactgttc gccaggctca aggccgcgc 3960  
gccccacggc gaggatctcg tctgtgacca tggcgatgcc tgccttgcga atatcatgg 4020  
ggaaaatggc cgctttctg gattcatcg ctgtggccgg ctgggtgtgg cggaccgcata 4080  
tcaggacata gcgttggcta cccgtgatat tgctgaagag cttggcgccg aatgggctga 4140  
ccgcttcctc gtgttttacg gtatcgccgc tcccgattcg cagcgatcg ctttctatcg 4200  
ccttcttgcac gagccattct gctggatggc tacaggtcgc agccctggcc tgcgtgattag 4260  
tgatgatgaa ccaggttatg accttgattt atttgcata cctaattcatt atgctgagga 4320  
tttggaaaagg gtgttatttc ctcatggact aattatggac aggactgaac gtctgtcg 4380  
agatgtatg aaggagatgg gaggccatca cattgttagcc ctctgtgtgc tcaagggggg 4440  
ctataaattc tttgctgacc tgcgtgatca catcaaaagca ctgaatagaa atagtgatag 4500  
atccattcct atgactgttag attttatcg actgaagagc tattgtatg accagtcaac 4560  
aggggacata aaagtaattt gttggatgtg tctctcaact ttaactggaa agaatgtctt 4620  
gattgtggaa gatataattt acactggcaa aacaatgcag actttgcctt ctttggctag 4680  
gcagtataat ccaaagatgg tcaagggtcgc aagcttgctg gtgaaaagga ccccacgaa 4740  
tgttggatg aagccagact ttgttggatt taaaattcca gacaaggttt tgtaggata 4800  
tgcccttgcac tataatgaat acttcaggaa ttgtatcat gtttggctca ttgtgaaac 4860  
tggaaaagca aaatacaaag cctaagcgcc cgctaacctg gttgctgact aattgagatg 4920  
catgcttgc atacttctgc ctgtggggc gcctgggac tttccacacc ctaactgaca 4980  
cacattccac agctgggttcc ttccgcctca gaaggtacac aggccaaatt gtaagcgtt 5040  
atattttgtt aaaattcgcg taaaattttt gttaaatcag ctcattttt aaccaatagg 5100  
ccgaaatcggtt caaaatccct tataaaatcaa aagaatagac cgagataggg ttgagtgtt 5160  
ttccagtttgc gaacaagagt ccactattaa agaacgtgga ctccaaacgtc aaagggcgaa 5220  
aaaccgtcta tcagggcgat gggccac 5247

<210> 21  
<211> 5382  
<212> DNA  
<213> Homo sapiens

<220>  
<221> modified\_base  
<222> (890)  
<223> a, c, t, g, other or unknown

<220>  
<221> modified\_base  
<222> (1042)  
<223> a, c, t, g, other or unknown

<400> 21  
cacctaaatt gtaagcgtta atattttgtt aaaattcgcg ttaaattttt gttaaatcag 60  
ctcattttt aaccaatagg ccgaaatcg caaaatccct tataaatcaa aagaatagac 120  
cgagataggg ttgagtgtt tcgcgtttt gaacaagagt ccactattaa agaacgtgga 180  
ctccaacgtc aaagggcgaa aaaccgtcta tcagggcgat ggcgcactac gtgaaccatc 240  
accctaatac agtttttgg ggtcgaggtg cctgtaaagca ctaaatcgga accctaaagg 300  
gagccccgaa tttagagctt gacggggaaa gccggcgaac gtggcgagaa aggaagggaa 360  
gaaagcgaaa ggagcggcgctt ctagggcgct ggcaagtgtt gcggtcacgc tgcgctgt 420  
caccacaccc gccgcgtta atgcggcgctt acagggcgcg tccatttcgc cattcaggct 480  
gwgcaactgt tggttggggc gatcggtgcg ggcctcttgc ctattacgc agctggcgaa 540  
agggggatgt gctgcaaggc gattaagttt ggttaacgcgca gggtttccc agtcacgacg 600  
ttgtaaaacg acggccagtg aattgtataa cgactcaata tagggcgaat tgggtacaat 660  
tcaattcgatc gacctcgaaa ttctaccggg taggggagggc gctttccca aggcagtcg 720  
gagcatgcgc tttagcagcc ccgttgggca ttggcgctt cacaagtggc ctctggcctc 780  
gcacacattt cacatccacc ggttaggcgc aaccggctcc gttttttgtt ggccccttcg 840  
cgccacccctt tactcctccc ctatgtcgat agttttttttt cgcggccgc ctcgcgtcg 900  
gcaggacgtg acaaatggaa atagcacgtc tcactagttt cgtgcagatg gacaaggcacc 960  
gctgagcaat ggagcgggta ggccttggg gcagcggcga atagcagctt tgctccttcg 1020  
ctttctgggc tcagaggctg gnaagggtt ggtccggggg cgggctcagg ggcgggctca 1080  
ggggcggggc gggcgcccgaa aggtcctccg gaggccccggc attctgcacg cttcaaaagc 1140  
gcacgtctgc cgcgttgc tcctttctt catctccggg ctttcgacc tgcatccatc 1200  
tagatctcgat gcaagctgaag cttaccatga ccgagtttcaaa gcccacggc ggcctcgcca 1260  
cccgcgacga cgtccccccgg gccgtacgca ccctcgccgc cgcgttgcgc gactaccccg 1320  
ccacgcgcac caccgtcgac ccggaccgc acatcgagcg ggtcaccgag ctgcagaagac 1380  
tcttcctcac ggcgttgcgg ctcgacatcg gcaaggtgtt ggtcgcggac gacggcgccg 1440  
cggtggcggt ctggaccacg ccggagagcg tcgaagcggg ggcgttgc gccgagatcg 1500  
gcccgcgcattt gggcgagttt agcggttccc ggctggccgc gcagcaacag atggaaggcc 1560  
tcctggcgcc gcaccgggccc caaggagccc gcgttgcggc ttggccacc gtcggcgctc 1620  
ttcgcccgac caccaggggca agggcttgcg aagcgccgcgtc gtgtttttttt gtagtggaggc 1680  
ggcccgagcgc gccgggggtgc ccgccttccg gtagacccctt ggcggccgc acctccctt 1740  
ctacgagcgg ctggcttca ccgttacccgc cgcgttgcgag gtgtccgcgaa gaccgcgcac 1800  
ctgggtgcgtt acccgcaacg ccgggttgcgc acgccccccc cacgaccgcg agcgccccac 1860  
cgaaaggagc gcaacgacccat atgcacgtat ggcactggc aggttaagtat caagggttagc 1920  
gatcttcaat attggccatt agccatattt ttcattttttt atatagcata aatcaatattt 1980  
ggctattggc cattgcatac gttgtatcta tataataa tgtacattt tattggctca 2040  
tgtccaatattt gaccggccatg ttggcatttgc ttattgtactt gtttataataa gtaatcaattt 2100  
acggggtcat tagttcatag cccatatacg gatgtccgcg ttacataact tacggtaat 2160  
ggcccgccctg gctgaccgc caacgacccccc ccggccatttgc cgttacccat gacgtatgtt 2220  
cccatagtaa cgccaaatagg gactttccat tgacgtcaat ggggtggagttt tttacggtaa 2280  
actggccactt tggcagtaca tcaagttgtt catatgcctt gtcggccccc tattgacgtc 2340  
aatgacggta aatggcccgcc ctggcatttgc gcccgttaca tgacccatc ggactttccct 2400  
acttggcagt acatctacgt attagtcatac gtttacccat ggttgcgtt gttttggcag 2460  
tacaccaatg gggttggata gccgttgc gtcacggggat ttccaaatgtt ccacccctt 2520

gacgtcaatg ggagttgtt ggcaccaa aatcaacggg actttccaaa gtcgtac 2580  
aactgcgtc gcccgcggc ttgacgcaaa tggcggtag gctgtacgg tggaggct 2640  
atataagcag agctcgaaa gtgaaccgtc agatcaactag aagcttatt gcggtagtt 2700  
atcacagtt aattgctaact gcagtcgtg cttctgacac aacagtctcg aacttaagct 2760  
gcagtgactc tcttaattaa ccaccgtac aggtgagtag tcggatctgc tacottaaga 2820  
gaggcctatc tggccagtt gcagtcgaag aaagaagtt aagagagccg aaacaagcgc 2880  
tcgtgagccc gaagtggcga gcccgtatctt ccccatcggt gatgtcggcg atataggcgc 2940  
cagcaaccgc acctgtggcg ccgggtgtgc cggccacgt gctccggcg tagaggatcc 3000  
acaggacggg tgggtcgcc atgatcgcgt agtcgatagt ggctccaagt agcgaagcga 3060  
gcaggactgg gcggcgccca aagcggtcgg acagtgcgtcc gagaacgggt gcgcataagaa 3120  
attgcataaa cgcataatgc gctagatcct tgctagatgc gaggccgcca ccgcgggtgaa 3180  
gctccagctt ttgttccctt tagtgagggt taatttcgag cttggcgtaa tcatggtcat 3240  
agctgtttcc tgggtgaaat tggatccgc tcacaattcc acacaacata cgagccggaa 3300  
gcataaaagtg taaagcctgg ggtgcctaatt gagtgagcta actcacatata attgcgttgc 3360  
gctcaactgcc cgctttccag tcgggaaacc tggcgccca gctgcattaa tgaatcggcc 3420  
aacgcgcggg gagaggcgt ttgcgtattt ggcgtcttc cgcttcctcg ctcactgact 3480  
cgctgcgtc ggtcggtcg ctgcggcgag cggatcgtc tcactcaaag gcggtaatac 3540  
ggttatccac agaatcaggg gataacgcga gaaagaacat gtgagcaaaa ggccagcaaa 3600  
aggccaggaa ccgtaaaaag gccgcgttgc tggcggtttt ccataggctc cgccccccctg 3660  
acgagcatca caaaaatcga cgctcaagtc agagggtggcg aaacccgaca ggactataaa 3720  
gataccaggc gtttccccc ggaagctccc tcgtgcgtc tccgttcccg accctgcccgc 3780  
ttaccggata cctgtccgccc ttctccctt cgggaagcgt ggcgttttcatagctcac 3840  
gctgttaggtt ttcaggatcg gtgttaggtcg ttcgcgtccaa gctgggtctgt gtgcacgaac 3900  
cccccggttca gcccgcgtc tgccgttccat ccgttaacta tcgtcttgc tccaacccgg 3960  
taagacacga cttatcgcca ctggcagca ccaactgttta caggattagc agagcgaggt 4020  
atgttaggcgg tgctacagag ttcttgaagt ggtggcttaa ctacggctac actagaagga 4080  
cagtatttgg tatctgcgtc ctgcgtgaagc cagttacctt cggaaaaaaga gttggtagct 4140  
cttgatccgg caaacaaacc accgctggta gcgggtgtt tttgtttgc aagcagcaga 4200  
ttacgcgcag aaaaaaaagga tctcaagaag atccttgc ttttctacg gggtctgacg 4260  
ctcagtggaa cgaaaactca cgttaaggga ttttgcgtcat gagattatca aaaaggatct 4320  
tcaccttagat cttttaaat taaaatgaa gttttaaatc aatctaaatg atatatgagt 4380  
aaacttggtc tgacagttac caatgttta tcagtggagc acctatctca gcgtatgtc 4440  
tatctcggtc atccatagtt gcctgactcc ccgtcggtta gataactacg atacgggagg 4500  
gcttaccatc tggcccccgt gctgcaatga taccgcgaga cccacgctca ccggctccag 4560  
attatcagc aataaaccag ccagccggaa gggccggagc cagaagtgtt cctgcaactt 4620  
tatccgcctc catccagttc attaattgtt gccggaaagc tagagtaatg agttcgccag 4680  
ttaatagtt ggcacacgtt gttgccattt ctacaggcat cgtgggtgtca cgctcggtc 4740  
ttgttatggc ttcattcgc tccgggttccc aacgtcaag gcgagttaca tgatccccca 4800  
tgggtgcaaa aaaagcggtt agtccttcg tccctccgt cttgtcaga agtaagttgg 4860  
ccgcagtgtt atcactcatg gttatggca gactgcataa ttctcttact gtcgtccat 4920  
ccgttaagatg ctttctgtg actgggtgagt actcaaccaa gtcattctga gaatagtgt 4980  
tgcggcgacc gagttgtct tggccggcggt caatacggga taataccgcg ccacatagca 5040  
gaactttaaa agtgcgtatc attggaaaac gttctcggtt gcgaaaactc tcaaggatct 5100  
taccgctgtt gagatccgt tcgtatgttac ccactcggtc acccaactga tcttcagcat 5160  
cttttacttt caccagcggt tctgggtgag caaaacagg aaggcaaaa gcccggaaaa 5220  
aggaataaag ggcgacacgg aatgttga tactcataact tttccctttt caatattatt 5280  
gaagcattta tcagggttat tggctcatga gcggtatcat atttgaatgt atttagaaaa 5340  
ataaaacaaat aggggttccg cgcacatttc cccgaaaaagt gc 5382

<210> 22  
<211> 9737  
<212> DNA  
<213> Homo sapiens

<220>  
<221> modified\_base  
<222> (8347)  
<223> a, c, t, g, other or unknown

```
<220>
<221> modified_base
<222> (8499)
<223> a, c, t, g, other or unknown
```

<400> 22  
gatcttcaat atggccatt agccatatta ttcattgggtt atatagcata aatcaatatt 60  
ggctattggc cattgcatac gttgtatcta tatacataata tgtacattta tattggotca 120  
tgtccaatat gaccgcattg ttggcattga ttattgacta gttattaata gtaatcaatt 180  
acggggtcat tagttcatag cccatatatg gagttcccg gttacataact tacggtaat 240  
ggcccgctg gctgaccgccc caacgacccc cgccccattga cgtcaataat gacgtatgtt 300  
cccatagtaa cgccaatagg gacttccat tgacgtcaat gggggagta tttacggtaa 360  
actgcccact tggcagtaca tcaagtgtat catatgcca gtcggccccc tattgacgtc 420  
aatgacggta aatggcccgctg ctggcattat gcccagtaca tgaccctacg ggactttcct 480  
acttggcagt acatctacgt attagtcattc gctattacca tggtgatgctg gttttggcag 540  
tacaccaatg ggcgtggata gcggttgcac tcaacgggat ttcaaggtct ccacccatt 600  
gacgtcaatg ggagttgtt ttggcaccaa aatcaacggg actttccaaa atgtcgtaac 660  
aactgcgatc gcccggcccg ttgacgcaaa tggggcggtag gctgtacgg tgggaggtct 720  
atataaggcag agctcgatca gtgaaccgctc agatcactga attctgacga cctactgatt 780  
aacggccata gaggcctcct gcagaactgt cttagtgaca actatcgatt tccacacatt 840  
atacgagccg atgttaatttgc tcaacagctc atgcattacg tccggggagc agacaagccc 900  
gaccatggct cgagtaatac gactcactat agggcgacag gctacctaa 960  
ggcctatctg gccgtttaaa cagatgtta taagagacag gtagcctgtc 1020  
tcttatacac atctagatcc ttgctagatg cgaccaattc tcatgttgc cagttatca 1080  
tcgcagatcc ttagcttgc ttgtgcactc tcagttacaat ctgctctgtc 1140  
taagccagta tctgctccct gcttgtgtt gggaggtcgc tgagtagtgc 1200  
ttaaagctac aacaaggca ggcgttgcacc acaattgcatttgc ggagcaaaa 1260  
ggcgtttgc gctgcttcgc gatgtacggg ccagatatac gctgtatctga cttagggactagg 1320  
gtgtgttttag ggcgttgcggt tgtagtgcgt taggagtccc ctcaggatatac 1380  
agtagttcg ctttgcata gggaggggaa aatgttagtct tatgcataac acttgttagtc 1440  
ttgcaacatg gtaacgtatgc gttacaaca tgccttacaa ggagagaaaa 1500  
atgccgatttgc gtggaaatggaa ggtggtacga tcgtgcctt ttaggaaggc aacagacagg 1560  
tctgacatgg attggacgaa ccactgaatt ccgcattgc gagaatttgc tatttaagt 1620  
cctagctcga tacaataaaac gccatttgcattcaccac attgggtgtc acctccaagc 1680  
tgggtaccatg ctgcttagcct cgagacgcgt gatttcctt gaaagttgtc atgggttgtt 1740  
cgctaaactg catcgctcgct gtgtcccaga acatgggcatttgc gggacactgc 1800  
cctggccacc gctcaggaat gaattcagat atttccagag aatgaccaca acctcttcag 1860  
tagaaaggtaa acagaatctg gtgattatgg gtaagaagac ctgggtctcc attcctgaga 1920  
agaatcgacc tttaaagggtt agaatttactt tagttctcag cagagaactc aaggaacctc 1980  
cacaaggagc tcattttctt tccagaagtc tagatgtatgc cttaaaactt actgaacaac 2040  
cagaatttagc aaataaaagta gacatgggtct ggatagttgg tggcagttctt gttataagg 2100  
aagccatgaa tcaccaggc catcttaaac tatttgcatttgc aaggatcatg caagactttg 2160  
aaagtgcacac gtttttccaa gaaattgtt gggagaaata taaacttctg ccagaatacc 2220  
cagggtttct ctctgtatgc caggaggaga aaggcattaa gtacaaattt gaagtatatg 2280  
agaagaatgt taattaaggc caccaataac tgccttaaaa aaattacgcg cccgcctgccc 2340  
actcatcgca gtactgttgcatttgcatttgc gacatggaa gcatcacaaggatc 2400  
cggtatgtg aacctgaatc gccagggca tcagcacctt gtcgccttgc gtataatatt 2460  
tgcccatggt gaaaacgggg gcgaaagaatgt tgccatatt gcccacgtt aaatcaaaac 2520  
tggtaaaactt caccaggatggc ttggctgaga cggaaaaacat attctcaata aaccctttag 2580  
ggaaaataggc cagggtttca ccgttaacacg ccacatcttgc gaaatataatg tgtagaaactt 2640  
gccggaaatc gtcgtgtat tcactccaga gcgatgaaaa cgttgcatttgc 2700  
aaacgggtgtt acaagggtgtt acactatccc atatcaccag ttcattggca 2760  
tacggaaattc cggatgagca ttcatcaggc gggcaagaat gtgaataaaag gccggataaa 2820  
acttgcgtt atttttctt acggctttaaaaaggccgt aatatccagc tgaacggctc 2880  
ggttataggt acattgagca actgactgaa atgcctcaaa atgttcttgc 2940  
gggatataatc aacgggtgtt tatccagtga ttttttctc catttagct tccttagctc 3000  
ctgaaaatct cgataactca aaaaatacgc cccgttagtgc tcttatttca ttatggtaa 3060  
agttggaaacc tcttacgtgc cgatcaacgt ctcattttcg ccaaaatatttgc 3120  
taaggcgcgcg

cgctctcctg gctaggagtc ~~gt~~ tagaaaag gactaccgac gaaggaactt ~~gg~~ gtcgcccc 3180  
tgttgcgtatatggaggta gtaagaccc ccttacaac ctaaggcgag gaactgcct 3240  
tgctattcca caatgtcgcc ttacaccatt gagtcgtc cccttggaa tggccctgg 3300  
acccggccca caacctggcc cgctaaggga gtccattgtc tgttatttca tggtctttt 3360  
acaaactcat atatttgcgt aggtttgaa ggatggatt aaggacctg ttatgacaaa 3420  
gcccgctcct acctgcaata tcaggggtgac tgtgtgcgc tttgacgtg gagtagattt 3480  
gcctccctgg tttccaccta tggtggaaagg ggctgccgcg gaggggtgatg acggagatga 3540  
cgagatgaa ggaggtgatg gagatgaggg tgaggaaggg caggagtatg gtaacttg 3600  
aggagacgcc ctcaatcgta taaaagccg tttttccccc cgcactaaag aataaattccc 3660  
cagtagacat catgcgtgct gtgggtgtat ttctgcccc ctgtcttgc accattttcg 3720  
tcctcccaac atggggcaat tgggcatacc catgttgcgtca cgtcactcg ctccgcgc 3780  
aacaccccttct cgcgttggaa aacattagcg acatttacct ggtgagcaat cagacatgcg 3840  
acggctttag cctggcctcc taaaattcac ctaagaatgg gagcaaccag catgcaggaa 3900  
aaggacaagc agcgaaaatt cacgccccct tgggaggtgg cgccatatgc aaaggatagc 3960  
actcccaactc tactactggg tatcatatgc tgactgtata tgcatgagga tagcatatgc 4020  
tacccggata cagattagga tagcatatac tacccagata tagatttagga tagcatatgc 4080  
tacccagata tagattagga tagcctatgc tacccagata taaaatttagga tagcatatac 4140  
tacccagata tagattagga tagcatatgc tacccagata tagatttagga tagcctatgc 4200  
tacccagata tagattagga tagcatatgc tacccagata tagatttagga tagcatatgc 4260  
tatccagata ttgggttagt atatgttacc cagatataaa ttaggatagc atataactacc 4320  
ctaattctcta ttaggatagc atatgttacc cggatatacg ttaggatagc atataactacc 4380  
cagatatacg ttaggatagc atatgttacc cagatatacg ttaggatagc ctatgttacc 4440  
cagatataaa ttaggatagc atataactacc cagatatacg ttaggatagc atatgttacc 4500  
cagatatacg ttaggatagc ctatgttacc cagatatacg ttaggatagc atatgttacc 4560  
cagatatttgc ggtgtatgat gctaccatgc gcaacattag cccaccgtgc tctcagcgac 4620  
ctcgtgaata tgaggaccaa caaccctgtc cttggcgctc aggccgcaatgt gtgtgtatt 4680  
tgccctccag atcgcagcaa tcgcgccccct atcttggcccc gcccacccatc ttatgcagg 4740  
attccccggg gtgcattatgc tggtttgtg ggcaagtgg ttagccgcg tggtagccgg 4800  
ggttacaatc agccaagtttta ttacaccctt atttacatgt ccaaaaaccgc agggccggcgt 4860  
gtgggggctg acgcgtcccccc ccactccaca atttcaaaaaaa aagagtggc cacttgtt 4920  
tgtttatggg cccatggc tggtggcccccc gtttaatttt cgggggtgtt agagacaacc 4980  
agttggatgtcc gctgctgtcg gcttccactc tctttccct ttttacatgtt agagtgttac 5040  
aacatgggttc acctgttcttgc ttttccctgcctt gggacacatc ttaataaccc cagtatcata 5100  
ttgcactagg attatgttgc tccatagcc ataaattcgt tgagatggc catccagtct 5160  
ttacggcttg tcccccccccc atggatttctt attgttacaaatg atattcagaa tgtttcatc 5220  
ctacactagt atttattgtcc caaggggttt tgaggggtt tattgggtgc atagcacaat 5280  
gccaccactg aaccccccgtt ccaaattttt ttctggggcc gtcacccgtt accttgc 5340  
cgagcacccctc acatacacccct tactgttccac aactcagcag ttattctt agctaaacga 5400  
aggagaatga agaagcaggc gaagattcag gagaggccac tggccgcctcc ttgatcttca 5460  
gccactgccc ttgtactaa aatgggttccac taccctcgat gaatcctgcac cccatgtaaa 5520  
taaaaccgtg acagctcatg ggggtggaga tatcgctgtt cttttaggacc cttttactaa 5580  
ccctaattcg atagcatatg cttcccgatggtaacatat gctattgaat taggtttagt 5640  
ctggatagta tataactacta cccggggaaagc atatgttacc ctgtttagggt taacaagggg 5700  
gccttataaa cactattgtt aatggccctt tgggtcccg cttatcggtt gctacacagg 5760  
ccctctgtat tgacgttggat gtagccctcc gtagtcttcc tggggccccctg ggaggtacat 5820  
gtccccccagc attgggttggat gagcttccagc caagagttac acataaaaggc aatgttgcgt 5880  
tgcagtccac agactgcaaa gctgttccca ggttggaaaggc cactcagtgt tggcaaatgt 5940  
gcacatccat ttataaggat gtcactaca gtcagagaac cccttgcgtt ttggcccccc 6000  
ccctgttccac atgtggaaaca gggcccaggat ggcaggatgtt accaacaac tgaaggatt 6060  
acatgcactg ccccaatac aaaacaaaag cgctctcgat accagcgaag aagggcaga 6120  
gatggcgtag tcagggtttag ttctgtccggc ggcggccggc cgcaaggccg gccgatcca 6180  
caggacgggtt gttggccat tgcgtcgat gtcgtatgt gctccaaatgt gcaagcggag 6240  
caggactggg cggccggccaa agcgggtcgat cagtgcgttccg agaacgggtt cgcatagaaa 6300  
ttgcataac gcatatagcg ctatgttacc gcttaggtcg agatctgtcg agccatgtca 6360  
gcaaaaaggcc agcaaaaaggc cagggaccgt aaaaaggccg ctggctgtcc gttttccat 6420  
aggctccggcc cccctgacga gcatcacaaa aatcgacgtt caagtcagag gtggcgaaac 6480  
ccgacaggac tataaaagata ccaggcgatggat cccctggaa gtcacccctgtt ggcgttcc 6540  
gttccgaccc tggccgttac cgatgttcc tccgccttcc tcccttcggg aagcgtggcg 6600  
cttctcata gtcacgtcg taggtatctc agtgcgttgc aggtgcgttgc ctccaagctg 6660

ggctgtgtgc acgaaccccccgttcagccc gaccgctgctg ccttatccgg aactatcgt 6720  
ctttagtcca acccggttaag acacgactta tcgcoactgg cagcagccac tggtaacagg 6780  
attagcagag cgaggtatgt aggcgggtct acagagttct tgaagtgggt gcctaactac 6840  
ggctacacta gaaggacagt atttggtattc tgctctgc tgaagccagt tacccctcgaa 6900  
aaaagagttt gtagcttgc atccggcaaa caaacaccgg ctggtagccg tggtttttt 6960  
gttgcagaagc agcagattac ggcggaaaaaa aaaggatctc aagaagatcc tttgatctt 7020  
tctacgggtt ctgacgctca gtggAACGAA aactacgtt aagggatttt ggtcatgaga 7080  
ttatcaaaaaa ggtatctcac cttagatcctt ttatccgtt gaaataccgc acagatgcgt 7140  
aaggagaaaaa taccgcacca gaaatttgc agcgttaata attcagaaga actcgtcaag 7200  
aaggcgatag aaggcgatgc gctgcgaatc gggagccggc ataccgtaaa gcacggagaa 7260  
gcggtcagcc cattccggc caagctttc agcaatataca cgggttagcc acgctatgtc 7320  
ctgatagcgg tccggccacac ccagccggcc acagtcgtt aatccagaaaaa agcggccatt 7380  
ttccaccatg atattccggca agcaggcattt gccatgggtc acgacgagat cctcgccgtc 7440  
gggcgtgctc gccttgagcc tggcgaacag ttccggctggc gcgagccctt gatgtcttc 7500  
gtccagatca tcctgatcga caagaccggc ttccatccga gtacgtgtc gctcgatgcg 7560  
atgttcgtt tgggtgtcga atgggcagggtt agccggatca agcgtatgca gcccggccat 7620  
tgcattcagcc atgatggata ctttctcggtt aggagcaagg tgagatgaca ggagatcctg 7680  
ccccggact tcgcccataa gcaagccgtt cttcccgct tcagtgacaa cgtcgagcac 7740  
agctgcgcaa ggaacgccccg tcgtggccag ccacgatagc cgcgctgtc cgtttgcag 7800  
ttcattcagg gcaccggaca ggtcggtt gacaaaaaga accggggccccc cctgcgtga 7860  
cagccggaaac acggcgccat cagagcagcc gattgtctgt tggcccaggat catagccgaa 7920  
tagcctctcc acccaagccgg ccggagaacc tgcgtcaat ccatttttcaatcatgca 7980  
aaacgatcctt catcctgtt cttgatcaga gcttgcatttcc ctgcgtccatc agatccctgg 8040  
cgccgagaaaa gccatccagt ttactttgc gggctgtca accttaccag ataaaaagtgc 8100  
tcattcattgg aaaacattca attcgtcgac ctcgaaattt taccgggttag gggaggccgt 8160  
tttcccaagg cagtctggag catgcgtttt agcagccccg ctggggactt ggcgtacac 8220  
aaatggccctc tggcctcgca cacattccac atccaccgggtt aggcgcaccc cggctccgtt 8280  
cttgggtggc cccttcgcgc cacccttctac tcctccctta gtcaggaagt tccccccgc 8340  
cccgcanctc gcgtcgca ggacgtgaca aatggaaata gcacgtctca ctgtctcg 8400  
gcagatggac aagcaccgtt gagcaatggc gcccggtaggc ttggggca gcccggccata 8460  
gcagcttgc tccttcgtt tctgggtca gaggctggna agggggtgggtt ccggggggccg 8520  
gctcaggggc gggctcagggg gccccggccggc cggccggagg ttccggag gcccggcatt 8580  
ctgcacgctt caaaagcgca cgtctgcggc gctgttctcc ttccctcat ctccggccct 8640  
ttcgcacgtc atccatcttag atctcgagca gctgaagctt accatgaccg agtacaagcc 8700  
cacgggtgcgc ctcgcaccc ggcacgttccccccgtt gtcgcaccc tcgcgcgcgc 8760  
gttcggccac taccggcca cggccacac cgtcgacccgg gaccgcacca tcgagccgggt 8820  
caccgagctg caagaactct tcctcagcg cgtcggttgc gacatcgccca aggtgtgggt 8880  
cgccggacgac ggcggccggg tggcggtctg gaccacggccg gagagcgtcg aagcgggggc 8940  
gggtttcgcc gagatccggcc cgcgcattggc cgagttgagc gttcccgcc gggccgcga 9000  
gcaacagatg gaaggcctcc tggcgccgca ccggggccaa ggagcccgccg tggttccttg 9060  
gccaccgtc gggcgatcc gcccggaccac cagggcaagg gtctggcaag cgcgtcg 9120  
ctcccccggag tggaggccggc cgagcgcgc ggggtggcccg cttcccttgc gacccggcc 9180  
ccccggcaacc tcccttcgtt cggccggctc ggcttcacccg tcaccggca cgtcgagggt 9240  
cccgaaaggac cgcgcacccgt gtcgtcgacc cgcacccgg gtcgtcgacc cccggccac 9300  
gaccggcagc gcccggaccac aaggagcgcg cgcacccatg catcgatggc actggggcagg 9360  
taagtatcaa ggttagccggc cgttaacctg gttgtactt aatttggatg catgtttgc 9420  
atacttctgc ctgctggggc gcctggggac tttccacacc ctaactgaca cacattccac 9480  
agctgggttct ttccgcctca gaaggtacac aggcggaaattt gtaagcgttta atattttgtt 9540  
aaaatccgcg ttaaatttt gttaaatcag ctcattttt aaccaatagg ccgaaatcgg 9600  
caaaatccct tataaatcaa aagaatagac cgagataggg ttgagtgtt gttccagttt 9660  
gaacaagagt ccactattaa agaacgtgga ctccaaacgtc aaaggccggaa aaaccgtcta 9720  
tcagggcgat gggccac 9737

<210> 23  
<211> 9737  
<212> DNA  
<213> Homo sapiens

<220>  
<221> modified\_base  
<222> (8347)  
<223> a, c, t, g, other or unknown

```
<220>
<221> modified_base
<222> (8499)
<223> a, c, t, g, other or unknown
```

<400> 23

ggttataaggta catttgcacatgtactgaa atgcctcaaa atgttcttta gatgccatt 2940  
ggatatatac aacgggtgtat tatccagtga ttttttctc cattttagct tccttagctc 3000  
ctgaaaatct cgataactca aaaaatacgc cggtagtga tcttatttca ttatggtaa 3060  
agttggacc tcttacgtgc cgatcaacgt ctcatattcg ccaaattaaat taaggcgcgc 3120  
cgctctctcg gctaggagtc acgttagaaag gactaccgac gaaggaaactt gggtcgccgg 3180  
tgtgttcgtat tatggaggta gtaagacctc ccttacaac ctaaggcgag gaaactgcct 3240  
tgctattcca caatgtcgctt acatgtcgctc ttacaccatt gagtcgtctc ccctttggaa tggccctgg 3300  
accggccca caacctggcc cgctaaggga gtccattgtc tgttatttca tggtctttt 3360  
acaaaactcat atatttgcgt aggtttgaa ggatgcgatt aaggacctg ttatgacaaa 3420  
gcccgcctcct acctgcaata tcagggtgac tgggtgcagc tttgacgatg gagtagattt 3480  
gcctccctgg tttccaccta tgggtggagg ggctgcccgc gagggtgatg acggagatga 3540  
cgagatgaa ggaggtgatg gagatgaggg tgaggaaggg caggagtgtat gtaacttgc 3600  
aggagacgccc tcaatcgta taaaagccg tggattcccc cgcactaaag aataaatccc 3660  
cagtagacat catgcgtgct gttgggtgtat ttctggccat ctgtcttgc accatttcg 3720  
tcctcccaac atggggcaat tgggcatacc catgtgtca cgtcactcag ctccgcgc 3780  
aacacccctt cgcgttggaa aacattagcg acatttacct ggtgagcaat cagacatgcg 3840  
acggctttag cctggcctcc taaaattcac ctaagaatgg gagcaaccag catgcaggaa 3900  
aaggacaago agcgaaaatt cacgccccct tgggaggtgg cgcatatgc aaaggatagc 3960  
actcccactc tactactggg tatcatatgc tgactgtata tgcatacgaa tagcatatgc 4020  
tacccggata cagattagga tagcatatac taccagata tagattagga tagcatatgc 4080  
tacccagata tagattagga tagcatatgc taccagata taaattagga tagcatatgc 4140  
tacccagata tagattagga tagcatatgc taccagata tagattagga tagcatatgc 4200  
tacccagata tagattagga tagcatatgc taccagata tagattagga tagcatatgc 4260  
tatccagata tttgggtgt atatgcattc cagatataaa ttaggatagc atataactacc 4320  
ctaattctcta tttaggatagc atatgcattc cggatacaga ttaggatagc atataactacc 4380  
cagatataga tttaggatagc atatgcattc cagatataga ttaggatagc ctatgcattc 4440  
cagatataaa tttaggatagc atataactacc cagatataga ttaggatagc atatgcattc 4500  
cagatataga tttaggatagc ctatgcattc cagatataga ttaggatagc atatgcattc 4560  
cagatatttgc ggtgttat tgcattccatg gcaacattag cccaccgtgc tctcagcgac 4620  
ctcgtaata tgaggaccaa caaccctgtg cttggcgc 4680  
tgtccctccag atcgacgaa tggccccct atctggccc gcccacctac ttatgcagg 4740  
attccccggg gtgcattag tggtttgcgg gcaagtggg ttgaccgcgg tggtagcgg 4800  
ggttacaatc agccaagttt ttacaccctt attttacagt ccaaaacccgc agggcggcgt 4860  
gtgggggctg acgcgtgccc ccactccaca atttcaaaaaaa aaagagtggc cacttgtctt 4920  
tgtttatggg cccatggc gtggagccccc gttaatttt cgggggtgtt agagacaacc 4980  
agtggagtcc gctgctgtcg ggttccactc tctttccct tggtaaaat agagtgtac 5040  
aacatggttc acctgtcttgc tccctgcctt gggacacatc ttaataaccc cagtatcata 5100  
ttgcactagg attatgtgtt gcccatacgcc ataaattcgt gtgagatgga catccagtct 5160  
ttacggcttgc tccccacccc atggatttgcatttgcattc 5220  
ctacactagt atttatttgc caaggggttt gtgagggtta tattgggtgc atgcacaat 5280  
gccaccactg aaccccccgt ccaaattttt ttctgggggc gtcacctgaa acctgtttt 5340  
cgagcacccctc acatacacccct tactgttccac aactcagcag ttattctatt agctaaacga 5400  
aggagaatga agaagcaggc gaagattcag gagagttcac tgccgcctcc ttgatcttca 5460  
gcoactgccc ttgtgactaa aatggttcac taccctcgat gaatcctgac cccatgtaaa 5520  
taaaaccgtg acagctcatg ggttggaga tatcgctgtt ctttaggacc cttttactaa 5580  
ccctaattcg atagcatatg ctcccggtt ggtacatat gctattgaat taggttagt 5640  
ctggatagta tataactacta cccgggaagc atatgcattc cgtttagggt taacaagggg 5700  
gccttataaa cactattgtc aatggcccttgc tgggggtccg ttatcggtt gtcacacagg 5760  
ccctctgtat tgacgttgcgtt gtggcccccgttcc tggggccctg ggaggtacat 5820  
gtccccccagc attgggtgtaa gagcttcagc caagagttac acataaaaggc aatgttgcgt 5880  
tgcaatccac agactgcaaa gtcgtctccat ggttggaaagc cactcagtgt tggcaaatgt 5940  
gcacatccat ttataaggat gtcactaca gtcagagaac ccctttgtgt ttggcccccc 6000  
cccggtcactc atgtggaaaca gggcccgatggc ggcaagttgtt accaaccac tgaaggatt 6060  
acatgcactg ccccaatac aaaaacaaaag cgctcctcgat accagcgaag aaggggcaga 6120  
gatggccgtat tcagggttttag ttcgtccggc ggcggccggc cgcaaggcgc gcccggatcca 6180  
cagacgggtt gttggccca tgatcgctgt gtcgatagtg gctccaagta gcaagcggc 6240  
cagactggg cggccggccaa agcgggtcgaa cagtgctccg agaacgggtt cgcataaaaa 6300  
ttgcataac gcatatagcg ctagatcctt gctagatgcg agatctgtcg agccatgtga 6360  
gcaaaaaggcc agcaaaaaggc caggaaccgt aaaaaggccg cggtgctggc gttttccat 6420

aggctccgcc cccctgacga tatacaca aaa aatcgacgct caagtcaagag gggcgaaac 6480  
 ccgacaggac tataaaagata ccaggcggtt cccctggaa gtccttcgt ggcctctcc 6540  
 gttccgaccc tgccgcttac cgatcacctg tccgccttc tcccttcggg aagcgtggcg 6600  
 ctttctcata gtcacgctg taggtatctc agttcggtgt aggtcggtcg ctccaaagctg 6660  
 ggctgtgtgc acgaaccccc cgtttagcccc gaccgtcgct cttatccgg taactatcg 6720  
 cttgagtcctt aaccggtaag acacgactta tcgccactgg cagcagccac tggttaacagg 6780  
 attagcagag cgaggtatgt aggcgggtgtc acagagttt tgaagtgggtg gcctaactac 6840  
 ggctacacta gaaggacagt atttggtatac tgcgctctgc tgaagccagt taccttcgga 6900  
 aaaagagttg gtagcttgc atccggcaaa caaaccacccg ctggtagccg tggtttttt 6960  
 gtttgcagc agcagattac ggcgcagaaaa aaaggatctc aagaagatcc tttgatctt 7020  
 tctacggggt ctgacgctca gtggAACggaa aactcacgtt aagggatttt ggtcatgaga 7080  
 ttatcaaaaaa ggatcttcac cttagatcctt ttatcggtgt gaaataccgc acagatcg 7140  
 aaggagaaaaa taccgcatca ggaaattgtt agcgtaata attcagaaga actcgtaag 7200  
 aaggcgatag aaggcgatgc gctgcgaatc gggagcggcg ataccgtaaa gcacgaggaa 7260  
 gcggtcagcc cattcgccgc caagctcttc agcaatatca cgggttagcca acgctatgtc 7320  
 ctgatagcg 7380  
 tccgccccac ccagccggcc acagtcgatg atcccgaaaa agcgccatt 7380  
 ttccaccatg atattcgca agcaggcatc gccatgggtc acgacgagat cctcgccgtc 7440  
 gggcatgctc gccttgagcc tgccgaaacag ttccggctggc gcgagccct gatgctttc 7500  
 gtccagatca tcctgatcga caagaccggc ttccatccga gtacgtgtc gtcgatcg 7560  
 atgtttcgct tggtggtgcg atgggcagg agccgatca agcgatgtca gccggccat 7620  
 tgcattcagcc atgatggata ctttctcgcc aggagcaagg tgagatgaca ggagatctg 7680  
 ccccgcaact tcgcccataa gcagccagtc cttcccgtt tcagtgacaa cgtcgagcac 7740  
 agctgcgcaa ggaacccccg tcgtggccag ccacgatagc cgcgctgcct cgtttgcag 7800  
 ttcattcagg gcaccggaca ggtcggtctt gacaaaaaa accggggcc cctgcgctga 7860  
 cagccggaaac acggcggcat cagagcagcc gattgtctgt tggcccagt catagccgaa 7920  
 tagcctctcc acccaagcg 7980  
 aaacgatcct catcctgtct cttagatcaga gctttagtccc ctgcgccccatc agatccttgg 8040  
 cggcgagaaaa gccatccagt ttactttgca gggcttgc accttaccag ataaaaagtgc 8100  
 tcattcattgg aaaacattca attcgctcgac ctgcattttc taccggtag gggagggcgct 8160  
 tttcccaagg cagtctggag catgcgtttt agcagccccg ctggggactt ggcgtacac 8220  
 aagtggcctc tggcctcgca cacattccac atccaccggt aggcggccaa cggctccgtt 8280  
 ctttgggtgc cccttcgccc cacattctac tcctccctta gtcaggaatg tccccccgc 8340  
 cccgcanc 8400  
 gcagatggac aagcaccgct gagcaatggc gcgggttaggc ctttggggca gcggccaaata 8460  
 gcagctttgc tccttcgtt tctgggtgc gaggctggna aggggtgggt ccggggccgg 8520  
 gctcaggggc gggctcaggg gccccccggg cggcccaagg tcctccggag gcccggcatt 8580  
 ctgcacgctt caaaagcgca cgtctcgccg gctgttctcc tcttcctcat ctccggccct 8640  
 ttgcacctgc atccatcttag atctcgagca gctgaagctt accatgaccg agtacaagcc 8700  
 cacggtcg 8760  
 gtcgcccac 8820  
 gttcgccgac taccggcca cgcgcacac cgtcgaccgg gaccgcacca tcgagcggtt 8880  
 caccgagctg caagaactct tcctcagcg cgtcgccgtc gacatcgca aggtgtgggt 8940  
 cgcggacgac ggcggccggg tggcggtctg gaccacgccc gagagcgctg aagcggggcc 9000  
 ggttccgccc gagatcgccc cgcgcatggc cgagttgagc gtttccggc tggccgccc 9060  
 gcaacagatg gaaggcctcc tgccgcccga cccggccaa ggagcccg 9120  
 gcccaccgtc gggcgcttc gcccggaccac caggccaaagg gtctggcaag cgcgtcg 9180  
 ctccccggag tggaggccgc cggcgccgccc ggggtgggg ctttcctgaa gaccccg 9240  
 ccccgcaacc tcccttcta cggcgccctc ggcttcaccg tcaccggca cgtcgaggtt 9300  
 cccgaaggac cgcgcacccgt gtgcattgacc cgcacccgg gtgcctgacg cccggccac 9360  
 gaccggcagc gcccggaccga aaggagcgca cgcacccatg catcgatggc actgggcagg 9420  
 taagtatcaa ggttagcgcc cgttaacccgtt gttgcgtact aattgagatg catgtttgc 9480  
 atacttctgc ctgctggggac gcttggggac ttccacacc ctaactgaca cacattccac 9540  
 agctgggttctt ttccgcctca gaaggtacac aggccaaatt gtaagcgta atattttgtt 9600  
 aaaattcg 9660  
 caaaatccct tataaaatcaa aagaatagac cgagataggg ttgagtgttgc ttccagtttgc 9720  
 gaacaagagt ccactattaa agaacgtggc ctccaaacgtc aaaggccgaa aaaccgtcta 9737  
 tcaggccgat gggccac

```
<211> 9871
<212> DNA
<213> Homo sapiens
```

```
<220>
<221> modified_base
<222> (8481)
<223> a, c, t, g, other or unknown
```

```
<220>
<221> modified_base
<222> (8633)
<223> a, c, t, g, other or unknown
```

<400> 24  
gatcttcaat atggccatt agccatatta ttcattgggtt atatagcata aatcaatatt 60  
ggcttattggc cattgcatac gttgtatcta ttcataata tgtacattt tattggctca 120  
tgtccaatat gaccgcattt ttggcattga ttattgacta gttattaata gtaatcaatt 180  
acggggtcat tagttcatag cccatatacg gagttcccggtt tacataact tacggtaat 240  
ggcccgctg gctgaccgc caacgacccc cgccccattga cgtcaataat gacgtatgtt 300  
cccatagtaa cggcaatagg gactttccat tgacgtcaat gggtggagta tttacggtaa 360  
actgcccact tggcagtaca tcaagtgat catatgccaa gtccggccccc tattgacgtc 420  
aatgacggta aatggcccgctg ctggcattat gcccagtaca tgaccttacg ggactttcct 480  
acttggcagt acatctacgt attagtcata gctattacca tggtgatgctg gttttggcag 540  
tacaccaatg ggcgtggata gcggtttgac tcacggggat ttcaagatct ccacccatt 600  
gacgtcaatg ggagttgtt ttggcaccata aatcaacggg actttccaaa atgtcgtaac 660  
aactgcgtac gcccggcccg ttgaccaaa tggggcggtag gcgtgtacgg tgggaggtct 720  
atataagcag agtcgttta gtgaaccgtc agatcactga attctgacga cctactgatt 780  
aaagatctaa gctagcgcgg ccaccatggg ccctaaaaag aagcgtaaag tgcggccccc 840  
gaccgatgtc agcctggggg acgagctcca cttagacggc gaggacgtgg cgatggcgca 900  
tgccgacgctg ctagacgatt tcgatctgga catgttgggg gacggggatt ccccggggcc 960  
gggatttacc ccccacgact ccgcccccta cggcgctctg gatatggccg acttcgagtt 1020  
tgagcagatg ttaccgatg cccttggaaat tgacgagttac ggtggggaaat tcaggtgagt 1080  
actcgctacc ttaaggccta tctggccgtt taaacagatg tgtataagag acagctctct 1140  
taaggtagcc tgcgtcttat acacatctag atccttgcta gagtcgacca attctcatgt 1200  
ttgacagctt atcatcgtag atcctgagct tgcgttgc acttcgtatcaatctgctc 1260  
tgctgcccga tagttaagcc agtatactgtt ccctgttgcgtt gttgtggagg tegctgagta 1320  
gtgcgcgagc aaaatttaag ctacaacaag gcaaggcttg accgacaatt gcatgaagaa 1380  
tctgcttagg gttaggcggtt ttgcgtctgtc tgcgtatgtc cggggccagat atacgcgtat 1440  
ctgaggggac tagggtgtgtt tttagggcccc agcggggctt cggttgcgtacg cggtaggag 1500  
tcccctcagg atatagttagt ttgccttttgcataaggagg gggaaatgtatcttatatgtca 1560  
atacacttgt agtcttgcac catggtaacg atgagttac aacatgcctt acaaggagag 1620  
aaaaagcacc gtgcgtcccg attgggtgaa gtaagggtgtt acgatcgatgc ttctttagga 1680  
aggcaacaga caggtctgac atggattggc cgaaccactg aattccgcat tgcaagagata 1740  
attgtattta agtgccttagc tcgatataat aaacgcccatt tgaccattca ccacatttgt 1800  
gtgcaccccttcc aagctgggtt ccagctgcta gcctcgagac gcgtgtatttc cttcgaagct 1860  
tgtcatgggtt ggttcgttactgcgt cgctgtgtcc cagaacatgg gcatcgccaa 1920  
gaacggggac ctgcccggc caccgctcag gaatgaattc agatatttcc agagaatgac 1980  
cacaacccctt tcagtagaaat gtaaaacagaa tctgggtattt atgggtatgcgttgcgtt 2040  
ctccattccctt gagaagaatc gacctttaaa gggttagaaatt aatttagttc tcagcagaga 2100  
actcaaggaa cctccacaag gagctcattt tctttccaga agtcttagat atgccttaaa 2160  
acttactgaa caaccagaat tagcaataat agtagacatg gtctggatag ttgggtggcag 2220  
ttctgtttat aaggaagccat gtaatcaccc aggccatctt aaactatttg tgacaaggat 2280  
catgcaagac ttgaaaatgtt acacgtttt tccagaaattt gattggaga aatataaact 2340  
tctgcccagaa tacccaggtt ttctctctgtc tgcgttgcgtt gagaaggca ttaagtacaa 2400  
atttgaagta tatgagaaga atgttaattt agggcacccaa taactgcctt aaaaaaaatattt 2460  
cgccccggccc tgccactcat cgcagactgt ttgttaattca ttaagcattc tgccgacatg 2520  
gaagccatca cagacggcat gatgaacctg aatcgccagc ggcacatcagca ccttgcgtcc 2580  
ttgcgtataa tatttgcctt tggtaaaaac gggggcgaaag aagttgttca tattggccac 2640

gtttaaatca aaactggta ctcaccca gggattggct gagacgaaaa catattctc 2700  
aataaacctt ttagggaaat aggccaggtt ttcaccgtaa cacgccacat cttgcgaata 2760  
tatgtgtaga aactgcggaa aatcgtcgtg gtattcactc cagagcgatg aaaacgttc 2820  
agtttgctca tggaaaacgg tctaacaagg gtgaacacta tcccatatca ccagctcacc 2880  
gtcttcatt gccatacggaa atccggatg agcattcatac aggccggcaa gaatgtgaat 2940  
aaaggccgaa taaaacttgt gcttattttt cttaacggtc tttaaaaagg ccgtaatatc 3000  
cagctgaacg gtctggttat aggtacattt agcaactgac tgaaatgcct caaaatgttc 3060  
tttacgatgc cattggata tatcaacggt ggtatatacca gtgattttt tctccatttt 3120  
agcttcctta gctcctgaaa atctcgataa ctcaaaaat acgcccggta gtgatcttat 3180  
ttcattatgg tgaaagtgg aacctcttac gtgcgcgtca acgtctcatt ttcgccaaat 3240  
taattaaggc gcgcgcgtct cctggctagg agtcacgtag aaaggactac cgacgaagga 3300  
acttgggtcg cgggtgtgtt cgtatatacgaa ggtagtaaga cttcccttta caacctaagg 3360  
cgaggaactg ccctgctat tccacaatgt cgtcttacac cattgagtcg tctcccttt 3420  
ggaatggccc ctggacccgg cccacaaccc gggccgtaa gggagtccat tgtctgttat 3480  
ttcatggtct tttacaacaaatccatataattt gctgagggtt tgaaggatgc gattaaggac 3540  
cttggtatga caaagccgc tcctacctgc aatatacaggg tgactgtgtg cagcttgc 3600  
gatggagtag atttgcctcc ctggtttcca cctatgggg aaggggctgc cgcggagggt 3660  
gatgacggag atgacggaga tgaaggaggt gatggagatg agggtgagga agggcaggag 3720  
tgatgttaact tgtaggaga cgcctcaat cgtattaaaa ggcgtgtatt ccccgcaact 3780  
aaagaataaaa tccccagtag acatcatgcg tgctgttggt gtatttctgg ccatctgtct 3840  
tgcaccatt ttcgtcctcc caacatgggg caattggca taccatgtt gtcacgtcac 3900  
tcagctccgc gctcaacacc ttctcgcggtt ggaaaacatt agcgcacattt acctgggtgag 3960  
caatcagaca tgcgacggct ttagcctggc ctcccttaat tcacctaaga atgggagcaa 4020  
ccagcatgca gggaaaggac aagcagcgaa aattcacgcc ccccttggag gtggcggcat 4080  
atgcaaagga tagcactccc actctactac tgggtatcat atgctgactg tatatgcatt 4140  
aggatagcat atgctaccccg gatacagattt aggatagcat atactaccca gatatagatt 4200  
aggatagcat atgctacccca gatatagattt aggatagcat atgctacccca gatataaatt 4260  
aggatagcat atactaccca gatatagattt aggatagcat atgctacccca gatatagatt 4320  
aggatagcct atgctacccca gatatagattt aggatagcat atgctacccca gatatagatt 4380  
aggatagcat atgctatcca gatatttggg tagtatatgc taccatgataa taaatttagga 4440  
tagcatatac taccatatac tctatttagga tagcatatgc taccatgataa cagatttagga 4500  
tagcatatac taccatgataa tagatttagga tagcatatgc taccatgataa tagatttagga 4560  
tagcctatgc taccatgataa taaatttagga tagcatatac taccatgataa tagatttagga 4620  
tagcatatgc taccatgataa tagatttagga tagcctatgc taccatgataa tagatttagga 4680  
tagcatatgc tatccagata ttgggttagt atatgctacc catggcaaca tttagccacc 4740  
gtgctctcag cgacctcggtt aatatgagga ccaacaaccc tggcttgcgc gctcaggcgc 4800  
aagtgtgtgt aatttgcctt ccagatcgca gcaatcgcc cccatcttgc gcccggccac 4860  
ctacttatgc aggtattccc cgggggtgcca tttaggttt tggggcaag tggtttgacc 4920  
gcagtggta ggggggttac aatcagccaa gttattacac ctttttttta cagtccaaaa 4980  
ccgcaggcgc gctgtgggg gctgacgcgt gcccccaactc cacaatttca aaaaaaaagag 5040  
tggccacttg tctttttta tggggcccat tggcggtggag ccccggtttaa ttttcgggggg 5100  
tgtagagac aaccagtggaa gtcgcgtgtc gtcggcgtcc actctcttcc cccttgcatt 5160  
aaatagagtg taacaacatg gtcacccgtt ctggccctt gcctgggaca catcttataa 5220  
accccagttat catattgcac taggattatg tggccat agccataaat tcgtgtgaga 5280  
tggacatcca gtccttacgg ctgtccccca cccatggat ttctattgtt aaagatattc 5340  
agaatgtttc attcctacac tagtattttt tgcccaagggtt gtttggggagg gtttattttgg 5400  
tgtcatagca caatgcacc actgaacccc ccgtccaaat ttatttctgg gggcggtcacc 5460  
tgaaaccttg ttttcgagca ctcacatac accttactgt tcacaactca gcagttattc 5520  
tattagctaa acgaaggaga atgaagaagc aggcaagat tcaggagagt tcactgccc 5580  
ctccttgatc ttcagccact gccttgcgtt ctaaaatggt tcactaccct cgtgaatcc 5640  
tgaccccatg taaataaaac cgtgacagct catgggggtgg gagatatcgc tggctttag 5700  
gacccttta ctaaccctaa ttgcatacgca tatgcttccc gttgggttaac atatgctatt 5760  
gaatttaggtt tagtctggat agtataactt actaccggg aagcatatgc taccatgtt 5820  
gggttaacaa gggggcctta taaacactat tgctaattgc ctcttgggg tccgcttac 5880  
ggtagctaca caggcccttc tgattgacgt tggcggtggcc tcccgtagtc ttccctggcc 5940  
cctggggaggat acatgtcccc cagcattgggt gtaagagctt cagccaaagag ttacacataa 6000  
agccaatgtt gtgttgcagt ccacagactg caaagtctgc tccaggatga aagccactca 6060  
gtgttggcaaa atgtgcacat ccatttataa ggatgtcaac tacagtcaaga gaacccttt 6120  
gtgttggtc ccccccgttgc tcacatgtgg aacagggccc agttggcaag ttgtaccaac 6180

caactgaagg gattacatgc tgccccga atacaaaaca aaagcgctcc cgttaccaggc 6240  
gaagaagggg cagagatgcc gtagtcagg ttagttcg tcggcggcg ggccgcgaag 6300  
gcgcgcggc tccacaggac ggggtgtggc gccatgatcg cgtagtcgt agtggctcca 6360  
agttagcgaag cgagcaggac tgggcggcg ccaaagcggt cggacagtgc tccgagaacg 6420  
ggtgcgata gaaattgcat caacgcata agcgctagat ctttgctaga gtcgagatct 6480  
gtcgagccat gtgagcaaaa ggccagcaaa aggccaggaa cctgaaaaag gccgcgttgc 6540  
tggcgaaaa ccataggctc cgccccctg acgagcatca caaaaatcga cgctcaagtc 6600  
agaggtggcg aaaccggaca ggactataaa gataccaggc gtttccccct ggaagctccc 6660  
tcgtgcgctc tcctgttccg accctgcgc ttaccggata cctgtccggc ttttccctt 6720  
cgggaaagcgt ggcgccttct catagctcac gctgttaggt ttcgcgttcg gtgttaggtcg 6780  
ttcgctccaa gctgggctgt gtgcacgaac cccccgttca gcccgcacgc tgcccttat 6840  
ccggtaacta tcgtcttgcg tccaaacccgg taagacacga cttatgcoca ctggcagcag 6900  
ccactggtaa caggattagc agagcgaggat atgttaggcgg tgctacagag ttcttgaagt 6960  
ggtggcctaa ctacggctac actagaagga cagtatttgg tatctgcgt ctgctgaagc 7020  
cagttacctt cggaaaaaga gttggtagct cttgatccgg caaacaaacc accgctggta 7080  
gcgggtggttt ttttgttgc aagcagcaga ttacgcgcag aaaaaaagga tctcaagaag 7140  
atcctttgat ctttctacg gggcttgacg ctcagtgaa cggaaaactca cgtaaggga 7200  
ttttggtcat gagattatca aaaaggatct tcaccttagat cttttatcg gtgtgaaata 7260  
ccgcacagat gcgttaaggag aaaataccgc atcaggaaat tgtaagcggt aataattcag 7320  
aagaactcgt caagaaggcg atagaaggcg atgcgtgcg atacgggagc ggcgataaccg 7380  
taaagcacga ggaagcggtc agccattcg cgcacaaagct cttcagcaat atcacgggt 7440  
gcacacgcta tgcctgata gccgtccgac acaccagcc gcccacagtc gatgaatcca 7500  
gaaaagcgcc cattttccac catgatattc ggcaagcagg catgcgcatt ggtcacgcag 7560  
agatcctcgc cgtcgccat gtcgccttgc agcctggcga acagttcgcc tggcgcgagc 7620  
ccctgatgct cttcgccatc atcatcctga tcgacaagac cggcttccat ccgagtcgt 7680  
gctcgctcga tgcgtatgtt cgcttgggt tcgaatggc aggtagccgg atcaagcgta 7740  
tgcagccgccc gcattgcattc agccatgatg gatactttct cggcaggagc aaggtagat 7800  
gacaggagat cctgccccgg cacttcgccc aatagcagcc agtcccttcc cgcttcagtg 7860  
acaacgtcga gcacagctgc gcaaggaacg cccgtcggtt ccagccacga tagccgcgt 7920  
gcctcgctt gcagttcatt cagggcacccg gacagtcgg tcttgacaaa aagaaccggg 7980  
cgccccctgctcgtac cgtacagccg gacacacggcg gcatacggc agccgattgt ctgtgtgcc 8040  
cagtcatacg cgaatagcct cttccacccaa gcggccggag aacctgcgtt caatccatct 8100  
tgttcaatca tgcacaaacga tcctcattcgat gtctttgttgc cagagcttgc tccctgcgc 8160  
catcagatcc ttggcggcga gaaagccatc cagttactt tgcagggctt gtcaaccta 8220  
ccagataaaa gtgctcatca ttggaaaaca ttcaattcgt cgcacccgttcc atttaccgg 8280  
gttaggggagg cgttttcccccc aaggcagtct ggagcatgcg ctttagcagc cccgctggc 8340  
acttggcgct acacaagtgg cctctggccct cgcacacatt ccacatccac cggttaggcgc 8400  
caaccggctc cgttcttgg tgcccccttc ggcacccatc ctactccccc cctagtcagg 8460  
aagttcccccc cgcggccgc nctcgctcg tgcaggacgt gacaaatggc aatagcacgt 8520  
ctcaactagtc tcgtgcagat ggacaaggcac cgctgagcaa tggagcgggtt aggcccttgg 8580  
ggcagcggcc aatagcagct ttgccttc gctttctggg ctcagaggctt ggnaagggg 8640  
gggtccgggg gccccgtcag gggccggctc agggccgggg cggccgcggc aaggccctcc 8700  
ggaggccccc cattctgcac gttcaaaaag cgacacgttgc cccgcgttcc ctcccttcc 8760  
tcatctccgg gccttcgac ctgcattccat ctagatctcg agcagtcgttgc gcttaccatcg 8820  
accaggataca agccacccgtt ggcacccgc accccgcacgc acgtcccccc ggcgtacgc 8880  
accctcgcccg cgcgttcgc cgactacccc gccacccgc accacccgttgc cccggaccgc 8940  
cacatcgagc gggtcacccga gtcgcaagaa ctcttcctca cgcgcgttgc gtcgacatc 9000  
ggcaaggtgt gggtcggcga cgcacccgc gccgtggcgg tctggaccac gccggagagc 9060  
gtcgaaggcg gggccgggtt cggccagatc ggcacccgc tggccggat gaggccgttcc 9120  
cggtcgcccg cgcacccgc gatggaaaggc ctccctggcgc cgcacccgc ccaaggagcc 9180  
cgctgggttc ctggccac cgtcgccgtt cttccggcga ccacccaggc aagggtctgg 9240  
caagcggccgt cgtgtccccc ggagttggagg cggccagatc cgcacccgc cccgccttcc 9300  
tggagacctc cgcacccgc aaccccttc tctacgcgttgc gtcggcttc accgtcaccgc 9360  
ccgacgtcga ggtccccaa ggacccgcac cctgggtgc gacccgcac cccggtgcct 9420  
gaccccccgc ccacccgc cgcacccgc cggccaggac cgcacccgc catgcacatcg 9480  
tggcactggg caggttaagta tcaagggttag cggccgttca cctgggttgc gactaattga 9540  
gatgcatgtt ttgcataactt ctgcctgttgc gggccgttgc gacccgttca caccctaaact 9600  
gacacacatt ccacccgttgg ttcttccgc ctcagaaggatc acacccgcac aatttgcac 9660  
gttaatattt tgtaaaaattt cgcgttaat ttgtttaaaa tcagtcattt ttttaaccaa 9720

tagggcggaaa tcggcaaaaat ~~t~~cttataaaa tcaaaagaat agaccgagat ~~t~~gggttgagt 9780  
gttgttccag tttggAACAA gagtcacta ttaaagaacg tggactccaa cgtcaaagg 9840  
cAAAAAACCQ tctatcaqqq cgatggccca c 9871

```
<210> 25
<211> 10060
<212> DNA
<213> Homo sapiens
```

```
<220>
<221> modified_base
<222> (8670)
<223> a, c, t, g, other or unknown
```

```
<220>
<221> modified_base
<222> (8822)
<223> a, c, t, g, other or unknown
```

<400> 25  
gatcttcaat attggccatt agccatattt ttcattgggtt atatacgata aatcaatattt 60  
ggctattggc cattgcatac gttgtatcta tatacataata tgtacattt tattggctca 120  
tgtccaatat gaccgcccattt ttggcatttga ttattgactt gttatttata gtaatcaattt 180  
acggggtcattt tagttcatatg cccatataatg gagttcccgctt tacataact tacggtaat 240  
ggcccgctt gctgaccgc caacgacccc cggccatttga cgtcaataat gacgtatgtt 300  
cccatagtaa cgccaatagg gacttccat tgacgtcaat gggtggagttt tttacggtaa 360  
actgcccact tggcagtaca tcaagtgtat catatgccaa gtccggcccc tattgacgtc 420  
aatgacggta aatggcccgctt ctggcattat gcccagtaca tgaccttacg ggactttcct 480  
acttggcagt acatctacgt attagtcattt gctatttacca tggtgatgtc gttttggcag 540  
tacaccaatg ggcgtggata gcggttgcac tcaacgggat ttccaagtctt ccacccattt 600  
gacgtcaatg ggagtttgtt ttggcaccat aatcaacggg actttccaaa atgtcgtaac 660  
aactgcgatc gcccggcccg ttgaccaaaa tgggcggtagt gcggtacgg tgggaggtct 720  
atataagcag agtcgttta gtgaaccgtc agatcactga atttcgacga cctactgatt 780  
aacggccaga tctaagctt gttccctgaaa gatgaagctt ctgtcttctt tcgaacaaggc 840  
atgcgatatt tggcgactt aaaaagctt aatcaacggg gaaaaaccga agtgcgcca 900  
gtgtctgaag aacaacttggg agtgcgtca ctctccaaa accaaaaagggtt ctccgctgac 960  
tagggcacat ctgacagaag ttggaaatcaag gctagaaaaga ctggAACAGC tatttctact 1020  
gattttccctt cgagaagacc ttgacatgtt tttggaaaatg gattttttac aggatataaa 1080  
agcatttgcattt acaggattat ttgtacaaga taatgtgaat aaagatgccc tcacagatag 1140  
attggcattca gtggagactt atatgcctt aacattgaga cagcatagaa taagtgcgac 1200  
atcatcatcg gaagagagttt gtaacaaagg tcaaagacag ttgactgtat cgccggattt 1260  
caggtgagttt ctcgcttaccc ttaggccat tggccgtt aaacagatgt gtataagaga 1320  
cagctctctt aaggttagccctt gtctttata cacatctaga tcctgtcttagt agtcgacca 1380  
ttctctatgtt tgacagctt tcatcgacaa tccttgagctt gtatgggtca ctctcagttac 1440  
aatctgtctt gtcggccat agttaagcca gtatctgtc cctgtttgtt tggtggaggt 1500  
cgctgagttt tgccggagca aaatttaagc tacaacaagg caaggcttga cccacaattt 1560  
catgaagaat ctgcttaggg tttaggcgtt tgcgtctgtt cgcgtatgtac gggccagata 1620  
tacgcgtatc tgaggggactt aggggtgttt taggcgcctt gggggctt ggttgtacgc 1680  
ggtaggatc cccctcaggat tatagttagtt tgcgttttgc atagggaggg gaaaatgttag 1740  
tcttatgcaat tacacttgcgtt gtcttgcac atggtaacga tgagttgtca acatgcctta 1800  
caaggagaga aaaagccatc tgcatggca ttgggtggaaatg taaggtggta cgatcggtcc 1860  
ttatttaggaa ggcacacagac aggtctgaca tggattggac gaaccactga attccgcattt 1920  
gcagagatataa ttgttatttgcgtt cgttgcattt aacggccattt gaccatttcac 1980  
cacattgggtt tgccacccatc agctgggtac cagctgtctt cctcgagacgc cgtgatttcc 2040  
ttcgaagctt gtcgttgcgtt gttcgttacaa ctgcgttgcgtt gctgtgtccc agaacatggg 2100  
catcgccaa gacggggacc tggccctggcc accgctcagg aatgaattca gatatttcca 2160  
gagaatgacc acaacccatc cagtagaagg taaacagaat ctgggtgatc tggtaagaa 2220  
gacctgggttccatccatcttgcgtt agaagaatcg acctttaaag ggtagaattt attttagttct 2280

cagcagagaa ctcaaggAAC cccacaagg agctcattt ctttccagaa gcttagatga 2340  
tgccttaaaa cttactgaac aaccagaatt agcaaaataaa gtagacatgg tctggatagt 2400  
tggtggcagt tctgttata aggaagccat gaatcaccca ggccatctta aactatttg 2460  
gacaaggatc atgcaagact ttgaaagtga cacgaaaaa ccagaaattt atttggagaa 2520  
atataaactt ctgccagaat acccagggtt tctctctgtat gtccaggagg agaaaaggcat 2580  
taagtacaaa ttgaaagtat atgagaagaa tgtaattaa gggcaccaat aactgcctt 2640  
aaaaaaattac gcccccgcct gccactcatc gcagttactgt tgtaattcat taagcattt 2700  
gccgacatgg aagccatcac agacggcatg atgaaacctga atcgccagcg gcatcagcac 2760  
cttgcgcct tgcgtataat atttgcctt ggtgaaaacg ggggcaaga agttgtccat 2820  
atggccacg tttaaatcaa aactggtaa actcaccagg ggattggctg agacgaaaaa 2880  
catattctca ataaaccctt tagggaaata ggccaggtt tcaccgtac acgcccacatc 2940  
ttgcgaatat atgtgttagaa actgcggaa atcgtcgtgg tattcactcc agagcgatga 3000  
aaacgttca gttggtcat ggaaaacggg gtaacaaggg tgaacactat cccatatcac 3060  
cagctcaccg tctttcattt ccatacgaa ttccggatga gcattcatca ggcgggcaag 3120  
aatgtgaata aaggccggat aaaacttggt ottattttc ttacgggtct taaaaaaggc 3180  
cgtaatatcc agctgaacgg tctgggtata ggtacattga gcaactgact gaaatgcctc 3240  
aaaatgttct ttacgatgcc attgggatat atcaacgggt gstatatccag tgatttttt 3300  
ctccatTTA gcttccttag ctccgtaaaaa tctcgataac tcaaaaaata cgcccggtag 3360  
tgatcttatt tcattatggt gaaagttgga acctcttacg tgccgatcaa cgtctcattt 3420  
tcgccaaatt aattaaggcg cgccgccttc ctggcttaga gtcacgtaga aaggactacc 3480  
gacgaaggaa ctgggtcgc cggtgtgtt gstatatggag gtagtaagac ctccctttac 3540  
aacctaaggc gaggaactgc cttgtctatt ccacaatgtc gtcttacacc attgagtcgt 3600  
ctccccTTTg gaatggcccc tggacccggc ccacaacctg gcccgtctt gtagtccatt 3660  
gtctgttatt tcatggtctt tttacaaact catatatttgc tggaggtttt gaaggatgctc 3720  
attaaggacc ttgttatgac aaagcccgct cctacctgca atatcagggt gactgtgtgc 3780  
agctttgacg atggagtaga ttgcctccc tggttccac ctatggtgga aggggctgccc 3840  
gcggagggtg atgacggaga tgacggagat gaaggagggtg atggagatga gggtaggaa 3900  
ggcaggagt gatgttaactt gtttaggagac gcccctcaatc gtattaaaag cctgttattt 3960  
ccccgcacta aagaataaaat ccccaactgatcatcatgct gctgttgggt tatttctggc 4020  
catctgtctt gtcaccattt tcgtctccc acatggggc aattgggcat acccatgtt 4080  
tcacgtcact cagctcccgcg ctcaacaccc tctcgcttg gaaaacattt gcgacattta 4140  
cctggtgagc aatcagacat gcgacggctt tagcctggcc tccttaaatt cacctaagaa 4200  
tgggagcaac cagcatgcag gaaaaggaca agcagcgaaa atoacgccc ccttgggagg 4260  
tggccgcata tgcAAaggat agcacttcca ctctactact ggttatcata tgctgactgt 4320  
atatgcata ggtatgcata tgctacccgg atacagatgg gatagcata tactaccatc 4380  
atatagatta ggtatgcata tgctacccgg atatagatgg gatagcata tgctaccatc 4440  
atataaatta ggtatgcata tactacccgg atatagatgg gatagcata tgctaccatc 4500  
atatagatta ggtatgcata tgctacccgg atatagatgg gatagcata tgctaccatc 4560  
atatagatta ggtatgcata tgctatccgg atatgggtt agtatatgtct acccagatgt 4620  
aaattaggat agcatataact accctaatct ctattaggat agcatatgtct acccggatgt 4680  
agattaggat agcatataact acccagatgtct acccagatgtct aaattaggat agcatatgtct acccagatgt 4740  
agattaggat agcctatgtct acccagatgtct acccagatgtct agattaggat agcctatgtct acccagatgt 4800  
agattaggat agcatatgtct acccagatgtct acccagatgtct agattaggat agcctatgtct acccagatgt 4860  
agattaggat agcatatgtct atccagatgtct ttgggttaga tatgttaccc atggcaacat 4920  
tagcccacccg tgctctcagc gacctcgta atatgaggac caacaaccct gtcggcgc 4980  
ctcaggcgca agtgtgtgtt atttgcctc cagatcgac caatcgcc cctatctgg 5040  
ccggccacc tacccatgca ggtatcccc ggggtgcctt tagtgggtt gtagggcaagt 5100  
ggtttgaccg cagtgggttag cgggggttaca atcagccaaat ttattacacc cttatTTTAC 5160  
agtccaaaac cgccggcgg cgtgtgggg ctgacgcgtg ccccaactcc acaatttcaa 5220  
aaaaaaaggat ggcacttgc ttgtttat gggccccatt ggcgtggagcc cccgtttaat 5280  
tttcgggggt gtagagaca accagtggag tccgctgtg tcggcgatca ctctcttcc 5340  
ccttgttaca aatagagtgt aacaacatgg ttcacctgtc ttggccctg cctgggacac 5400  
atcttaataa ccccaacttgc atattgcact aggattatgt gttgcccata gccataaatt 5460  
cgtgtgagat ggacatccag tcttacggc ttgtccccac cccatggatt tctattgtt 5520  
aagatattca gaatgttca ttccctacact agtattttt gcccaagggg tttgtgaggg 5580  
ttatattggc gtcatacgac aatgcacca ctgaacccccc cgtccaaatt ttattctggg 5640  
ggcgtcacct gaaaccttgc ttgcagcac ctcacataca ccttactgtt cacaactcag 5700  
cagttattctt attagctaa cgaaggagaa tgaagaagca ggcgaagatt caggagagtt 5760  
caactgcctc tcctgtatct tcagccactg cccttgcac taaaatgtt cactaccctc 5820



caaggagccc gcgtggttcc ggcccacc gtcgggcgtc ttgcggccac caccaggc 9420  
 agggcttggc aagcgccgtc gtgtccccgg gagtggaggc ggccgagcgc gcccgggtgc 9480  
 ccgccttcct ggagacctcc gcgcggcgca acctccctt ctacgagcgg ctggcttca 9540  
 ccgtcaccgc cgacgtcgag gtgcccgaag gaccgcgcac ctggtgcatg acccgcaagc 9600  
 ccggtgctg acgccccccc cacgaccgcg agcgccccgac cgaaaggaggc gcacgacccc 9660  
 atgcatcgat ggcactggc aggttaagtat caaggttagc ggccgctaacc ctggttgctg 9720  
 actaatttagt atgcatcgat tgcatacttc tgcctgctgg ggagcctggg gactttccac 9780  
 accctaactg acacacattc cacagctggt tctttccggc tcagaaggta cacaggcga 9840  
 attgttaagcg ttaatatttt gttaaaattt gcgttaaattt tttgttaaat cagtcattt 9900  
 tttaaccaat aggccgaaat cggcaaaatc ctttataaaat caaaagaata gaccgagata 9960  
 gggttgagtg ttgttccagt ttggaacaag agtcoactat taaagaacgt ggactccaac 10020  
 gtcggcggc gaaaaaccgt ctatcaggc gatggccac 10060

<210> 26  
 <211> 7714  
 <212> DNA  
 <213> Homo sapiens

<400> 26

tcaacgacag gagcacgatc atgcgcaccc gtggccagga cccaacgctg cccgagatgc 60  
 gccgcgtgcg gctgctggag atggcggacg cgatggatat gttctgc当地 gggttgggtt 120  
 ggcattcac agttctccgc aagaattgtat tggctccaaat tcttggagtg gtgaatccgt 180  
 tagcgaggtg cgcggcgtt ccattcaggt cgaggtggcc cggctccatg caccgcgacg 240  
 caacgcgggg aggcaacaa ggtataggcc ggcgcctaca atccatgc当地 acccggttcca 300  
 tggctcgcc gaggcggcat aaatcgccgt gacgatcagc ggtccagtgta tcgaagttag 360  
 gctggtaaga gccgcgagcg atccttgaag ctgtccctga tggcgtcat ctacctgcct 420  
 ggacagcatg gcctgcaacg cgggcattccc gatgc当地 cccg gaagcgagaa gaatcataat 480  
 ggggaaggcc atccagccctc gcgtcgccgaa cgccagcaag acgttagccca ggcgcgtccg 540  
 cgccatgccg ggcataatgg cctgcttctc gccgaaacgt ttggtggccg gaccagtgc 600  
 gaaggcttga ggcaggccgt gcaagattcc gaataccgc当地 agcgc当地 cggc cgatcatcg 660  
 cgcgctccag cggccgtt cctcgccgaa aatgacccag agcgctgc当地 gcaactgtcc 720  
 taaggttgc atgataaaaga agacagtc当地 aatgc当地 cggc当地 acgatagtc当地 tgccccgc当地 780  
 ccaccggaaag gagctgactg ggttgaaggc tctcaaggcc atcggc当地 gac gcttccctt 840  
 atgcgactcc tgcatttaga agcagccag tagtaggttgg agggccgttga gcaaccgc当地 900  
 cgcaaggaat ggtgcatgca aggagatggc gccc当地 acagt cccccc当地 gggccctgc 960  
 caccataccg acgccc当地 aacgc当地 ccat gagccggaag tggc当地 gagccc gatccccc 1020  
 atcggtgatg tcggc当地 atgatggccaggc aaccgc当地 acct gtggc当地 cccg tgatgc当地 1080  
 cacatgc当地 cccggc当地 tagtccacag gacgggtgtg tgc当地 cc当地 tgc当地 gtagtc 1140  
 gatagtggct ccaagtagcg aagcgagcg gactggccgg cggccaaagc ggtcggacag 1200  
 tgc当地 cc当地 acgggtgc当地 atagaaattt catcaacgc当地 tatagc当地 gca当地 caccgc当地 1260  
 atagtgactg ggc当地 atgctgtg cggatggac gatatccc当地 aagaggcccg gca当地 gtc当地 1320  
 cataaccaag cctatgc当地 cagcatcccg ggtgacggc当地 cc当地 gagatgca cgc当地 atgagcgc当地 1380  
 attgttagat ttc当地 atacacg gtgc当地 ctgact gctt当地 tagcaaa tt当地 taactgtg ataaactacc 1440  
 gcattaaagc ttatc当地 gatcc cccacacatta tacgagccgaa tggtaattt当地 caacagctca 1500  
 tgc当地 atgacgt cccgggagca gacaagcccg tc当地 agggc当地 cgc当地 tca当地 ggggtg 1560  
 tc当地 gggc当地 cttaactatg cggcatcaga gc当地 aggttgc当地 ct当地 gagatgtc accatatgc当地 1620  
 gtgtgaaata cccgacagat ggc当地 taaggagaaa aataccgc当地 atcaggc当地 gcc当地 attc当地 gcc当地 1680  
 caggc当地 tgc当地 gca aactgttggg aaggccgatc ggtgccc当地 tcttgc当地 tca当地 gcc当地 1740  
 ggc当地 gaaagggg ggtatgtc当地 gatccgatc aagttggta acgccc当地 aggttggc当地 tttcc当地 agtc 1800  
 acgacgttgc当地 aaaacgacgg cc当地 agtgc当地 atttgc当地 agtgc当地 cttc当地 gaatagggc当地 1860  
 gtaatgc当地 gatccggc当地 atcgctctt当地 taaggtagcc cgtgctggc当地 aacagctt当地 1920  
 atgggttata tgggtggcc当地 ct当地 agaaagct tggc当地 taaatc atggc当地 taaatc atggtc当地 atggttccctg 1980  
 tgc当地 gaaattt当地 ttc当地 atccgctc当地 acaattccac acaacatacg agccggaaagc ataaatgtca 2040  
 aaggccctggg tgc当地 ctaatga gtgagctaaat tc当地 acat当地 tggc当地 ttgc当地 cgc当地 tc当地 actgccc当地 2100  
 cttccagtc gggaaacctg tgc当地 tggccagc tgc当地 taaatg accccgc当地 gaggg tgc当地 cc当地 cccccc 2160  
 gtaacccccc当地 accgctgaaa gttctgcaaa gc当地 ctgatggg acataatgtcc atcagttcaa 2220  
 cggaaagtcta cacgaaagggtt tttgc当地 ctgg atgtgc当地 tgc当地 cc当地 ggcc当地 accccgg gtc当地 gagttg 2280  
 cgatgc当地 cc当地 gatgc当地 gtc当地 tggc当地 gatgc当地 tggaaacaattt atcctgc当地 taaatgc当地 2340

ggcctttata tggaaatgtg actgagtg gatatgctgt tttgtctgt aaaaacagaga 2400  
agctggctgt tatccactga gaagcgaacg aaacagtccg gaaaatctcc cattatcgta 2460  
gagatccgca ttataatct caggagcctg ttagcggtt ataggaagta gtgtctgtc 2520  
atgatgcctg caagcgtaa cggaaaacgt ttgaatatgc cttcaggaac aatagaaatc 2580  
ttcggtcggt gttacgttga aatggagcgg attatgtcag caatggacag aacaacctaa 2640  
tgaacacaga accatgtatgt ggtctgtccct tttacagcca gtatgtctcg ccgcagtcga 2700  
gcgcacaggcga aggcctcg agtgagcggag gaagcaccag ggaacagcac ttatatattc 2760  
tgcttacaca cgtatgcctga aaaaacttcc cttgggtta tccacttatac cacggggata 2820  
tttttataat tattttttt atagttttt gatctcttt ttttagagcgc cttgttaggc 2880  
tttatccatg ctggttctag agaagggttt gtgacaaatt gccccttcag tgtgacaaat 2940  
caccctcaaa tgacagtccct gtctgtgaca aattgccctt aaccctgtga caaattgccc 3000  
tcagaagaag ctgttttttcc acaaagttat ccctgcttat tgactctttt ttatttagtg 3060  
tgacaatcta aaaacttgc acacttcaca tggatctgtc atggcggaaa cagcggttat 3120  
caatcacaag aaacgtaaaa atagcccgcg aatcgccag tcaaaccgacc tcactgaggc 3180  
ggcatatagt ctctcccggtt atcaaaaacgt tatgtgtat ctgttcgtt accagatcg 3240  
aaaatctgtat ggcaccctac aggaacatga cggtatctgc gagatccatg ttgtcaaata 3300  
tgctgaaata ttcggatttga cctctgcggg agccagtaag gatatacggc aggcattgaa 3360  
gagtttcgccc gggaaaggaaat tggttttttgc tgcgcctgaa gaggatgcgg gcgatgaaaa 3420  
aggctatgaa tcttttcctt ggttatcaaa acgtgcgcac agtccatcca gagggctta 3480  
cagtgtacat atcaaccat attcatttc cttctttatc gggttacaga accggtttac 3540  
gcagtttcggg cttagtgaaa caaaagaaat caccatccg tatgccatgc gtttatacga 3600  
atccctgtgt cagtatcgta agccggatgg ctcaggcattc gtctctgtca aaatcgactg 3660  
gatcatagag cgttaccaggc tgctcaaaat ttacoagcgt atgcctgact tccggccgg 3720  
cttctgcag gtctgttta atgagatcaa cagcagaact ccaatgcggc tctcatacat 3780  
tgagaaaaag aaaggccgccc agacgactca tatcgatattt tccttcggc atatcacttc 3840  
catgacgaca ggtatgtctg agggttatct gtcacagatt tgagggttgt tcgtcacatt 3900  
tgttctgacc tactgagggt aatttgcac agtttgcgt ttccttcag cctgcattgaa 3960  
ttttctcata cttttgaac tgaatttt aaggaagcca aatttgaggg cagttgtca 4020  
cagttgattt ctttctctt cccttcgtca tgcgttgcata tattcggtt tagttcgtca 4080  
tcattgtga gggttgatta tcacagtttta ttactctgaa ttggctatcc gcgtgtgtac 4140  
ctctacctgg agttttccccc acgggtggata tttctcttgc cgttgcgtt aagagctatc 4200  
tgacagaaca gttcttcctt gcttcctcg cagttcgctc gctatgcgtc gttacacggc 4260  
tgcggcgagc gctatgtata ataagtgcgtt gaggatgtg ctcttcattt ctcctttgt 4320  
agtgttgctc ttatttaaa caactttgcg gtttttgat gactttgcga ttttgggtt 4380  
gctttgcagt aaattgcaag attaataaa aaaacgcaaa gcaatgatca aaggatgttc 4440  
agaatgaaac tcatggaaac acttaaccag tgcataaaacg ctgggtcatga aatgacgaaag 4500  
gctatcgcca ttgcacagtta taatgtatgc agccggaaag cgaggaaaat aaccggcgc 4560  
tggagaatag gtgaaggcgc ggtttagttt ctcaggctat cagagatgcc 4620  
gagaaaggcag ggcgactacc gcacccggat atggaaattc gaggacgggt tgagcaacgt 4680  
gttggttata caattgaaca attaatcat atgcgtgtatg tggtttgtac gcgattgcga 4740  
cgtgctgaag acgtatcc accgggtgatc ggggttgctg cccataaaagg tggcgtttac 4800  
aaaacctcag tttctgttca tcttgcctca gatctggctc tgaaggggct acgtgttttgc 4860  
ctcggttgcgg gtaacgaccc ccagggaaaca gcctcaatgt atcacggatg ggtaccagat 4920  
cttcatattc atgcagaaga cactctccctg ctttctatc ttggggaaa ggacgtgtc 4980  
acttatgcaa taaagcccac ttgcgtggccg gggctgaca ttattccttc ctgtctggct 5040  
ctgcaccgtt tggaaactga gtaatgggc aaatttgcgtt aaggtaaact gcccaccgt 5100  
ccacacctga tgcgtccactt ggcatttgcgaa actgttgcgc atgactatgc tgcgtatgtt 5160  
attgacagcgtt cgcctaaacctt gggatcggc acgatataatgc tgcgtatgtc tgctgtatgt 5220  
ctgattgttc ccacgcctgc tgagttgtttt gactacaccc cgcactgcgat gtttttcgtat 5280  
atgcctcgat atctgcctaa gaacgttgcgtt cttaaagggt tgcgttgcgt tgcgtatgtt 5340  
ttgccttacca aatacagcaa tagtaatggc tctcagtccc cgtggatgaa ggagcaaaatt 5400  
cgggatgcctt gggaaagcat gttctaaaaa aatgttgcgtt gtaaaacgcgat gtaagttgg 5460  
aaaggtcaga tccggatgag aactgtttt gaaacaggcca ttgcattact ctctcaact 5520  
ggtcgttgcgg gaaatgcgtt ttcttatttggt gaaacgttgcgtt gcaatgaaat tttcgatgt 5580  
ctgattaaac caccgtggaa gatttagataa tgaaggcgtgc gcctgttattt ccaaaacata 5640  
cgctcaatac tcaaccgggtt gaagatactt cgttgcgttcc accagactgc cgcgttgcgtt 5700  
attcgatgtt tgcgttgcgtt gggatgttgcgtt gttttttttt gttttttttt 5760  
gtgttcgggat gttttttttt tttttttttt tttttttttt tttttttttt 5820  
ctcggtatgtt gtcaggttgcgtt gttttttttt tttttttttt tttttttttt 5880

atctcatccc ttctttctta gactggtc aacagacacc ggcgttcggtaa gaagagtat 5940  
ctgggtgtcat agaaaattgcc gatggggagtc gccgtcgtaa agctgctgca cttaccgaaa 6000  
gtgattatcg tttctgggtt ggccgagctgg atgatgagca gatggctgca ttatccagat 6060  
tggtaacga ttatcgccca acaagtgcctt atgaacgtgg tcagcggttat gcaagccgat 6120  
tgcagaatga atttgcgtt aatatttctg cgctggctga tgccggaaaat atttacacgta 6180  
agattattac ccgctgtatc aacaccgcca aattgcctaa atcagttgtt gctcttttt 6240  
ctcaccccg tgaactatct gcccggtcag gtgatgcact tcaaaaagcc tttacagata 6300  
aagaggaatt acttaagcag caggcatcta accttcatga gcagaaaaaa gctgggggtga 6360  
tatttgaagc tgaagaagtt atcactctt taactctgt gcttaaaacg tcacatctgcat 6420  
caagaactag tttaagctca cgacatcagt ttgctcctgg agcgacagta ttgtataagg 6480  
gcgataaaaat ggtgcttaac ctggacaggt ctcgtgttcc aactgagtgat atagagaaaa 6540  
ttgaggccat tcttaaggaa cttgaaaagc cagcaccctg atgcgaccac gttttagtct 6600  
acgtttatct gtcttactt aatgtcctt gttacaggcc agaaaagcata actggcctgat 6660  
atattctctc tggccagaa gcttggccca ctgttccact tgtatcgtcg gtctgataat 6720  
cagactggga ccacggtccc actcgtatcg tcggctctgat tattagtctg ggaccacgg 6780  
ccactcgta tcgtcggtct gattattagt ctgggaccac ggtcccactc gtatcgtcgg 6840  
tctgataato agactggac cacggtccc ctcgtatcgat cggtctgatt attagtctgg 6900  
gaccatggtc ccactcgat ctcgtgtctg attattagtc tgggaccacg gtcccactcg 6960  
tacgtcggt ctgattatta gcttggaaacc acggtcccac tcgtatcgat ggtctgat 7020  
ttagtctggg accacggtcc cactcgatc gtcggctctgat ttattagtctg gggaccacg 7080  
tcccaactcgt gttgtcggtc tgattatcgat tctgggacca cgggtcccact ttttgcgtcg 7140  
atcagactat cagcgtgaga ctacgattcc atcaatgcct gtcaaggcga agtattgaca 7200  
tgcgtcgta acctgttagaa cggagtaacc tcgggtgtcg gttgtatgcc ttgtgtggat 7260  
tgcgtcgatc ttctgtttat ccacaacatt ttgcgcacgg ttatgtggac aaaatacctg 7320  
cgctagagaa aagagttgtt agaaaacgcaa aaaggccatc cgtcaggatg gccttctgct 7380  
taatttgcgtt cctggcagtt tatggcggggc gtcctgccc ccaccctccg ggcgttgct 7440  
tcgcaacgat caaatccgat cccggcgat ttgtcctact caggagagcg ttcaccgaca 7500  
aacaacagat aaaacgaaag goccagtctt tcgactgagc ctttcgtttt atttgcgtcc 7560  
tggcagttcc ctactctcgat atggggagac cccacactac catcgccgat acggcggttc 7620  
acttctgatc tcggcatggg gtcagggtggg accacccgatc tactgcccggc aggcaaattc 7680  
tgcgtcgatc ttctgtttatca gaccgcttct gcttgcgtggg ccgc 7714

<210> 27  
<211> 5314  
<212> DNA  
<213> Homo sapiens

<400> 27

gatcttcaat attggccatt agccatatta ttcatgggtt atatagcata aatcaatatt 60  
ggcttattggc cattgcatac gttgtatcta tatcataata tgcattttt tattggctca 120  
tgcattatcattt gaccggccatg ttggcattttt tatttgacta gttattataata gtaatcaatt 180  
acggggtcat tagttcatag cccatataatg gagttcccgat ttacataact tacgttaat 240  
ggcccgccctg gctgacccccc caacgaccatc cggccatttga cgtcaataat gacgtatgtt 300  
cccatagtaa cggccatagg gactttccat tgacgtcaat ggggtggagta tttacggtaa 360  
actgcccact tggcagttaca tcaagtgtat catatgcctt gtcggcccc tattgacgtc 420  
aatgacggta aatggcccgat ctggcattat gcccagtaca tgaccttacg ggactttctt 480  
acttggcagt acatctacgt attagtctatc gctattacca tgggtgtcg gttttggcag 540  
tacaccaatg ggcgtggata gcccgttttgc tcaacgggat ttccaaatgtt ccacccatt 600  
gacgtcaatg ggagttgtt ttggcaccata aatcaacggg actttccaaa atgtcgtaac 660  
aactgcgtatc gcccggcccg ttgacgcataa tggccgttag ggcgtgtacgg tgggaggtct 720  
atataaggcag agctcgatc ttgaaaccgtc agatcactga attctgacga cctactgatt 780  
aacggccata gaggcccttgc gacaaactgtt cttttgtaca actatcgatt tccacacatt 840  
atacgagccg atgttaatttgc tcaacacgttc atgcgtacgc tcccgccggc agacaagccc 900  
gaccatggct cggatataac gactcactat agggccacag gtgagttactc gctacctaa 960  
gagaggccata tctggccatgt tagcagtcga agaaagaagt ttaagagagc cggaaacaagc 1020  
gctcatgagc cggatgtggc gagcccgatc ttcccccattgc gtgatgtcg gatataaggc 1080  
gccagcaacc gcacctgtgg cggccgtat gcccggccacg atgcgtccgg cgttagaggat 1140  
ccacaggacg ggtgtggatc ccatgatcgatc gtagtcgata gtcggctccaa ttagcgtcaac 1200

gaggcaggact gggcggcgcc aagcggtc ggacagtgcg ccgagaacgg gtgcgcata 1260  
aaattgcata aacgcataata ggcgttagatc cttgcgttag tcgagatctg tcgagccatg 1320  
tgagcaaaag gcccggaaaa ggcgcggaaac cgtaaaaagg ccgcgttgc ggcgttttc 1380  
cataggctcc gccccctga cgagcatcac aaaaatcgac gtcagaatca gaggtggcga 1440  
aacccgacag gactataaaag ataccaggcg tttccccctg gaagctccct cgtgcgtct 1500  
cctgttccga ccctgcgcgt tacccggatac ctgtccgcct ttctccctc gggaaagcgtg 1560  
gcccgttctc atagctcagc ctgttaggtat ctcagttcgg tgttaggtcg tcgctccaag 1620  
ctgggctgtg tgacacgaaacc ccccggttcag cccgaccgcgt gcgccttatac cggttaactat 1680  
cgtcttgcgt ccaacccgggt aagacacgac ttatgcaccc tggcagcagc cactggtaac 1740  
aggattagca gaggcgggtt tgtaggcgtt gctacagagt tcttgaagt gtggccataac 1800  
tacggctaca cttagaggac agtatttggt atctgcgtc tgctgaagcc agttacctc 1860  
ggaaaaaagag ttggtagtctc ttgatccggc aaacaaacca ccgctggtag cggtggttt 1920  
tttggggca agcagcagat tacgcgcaga aaaaaaggat ctcaagaaga tccttgcata 1980  
tttctacgg ggtctgacgc toagtggaaac gaaaactcac gttaggat tttgggtcatg 2040  
agattatcaa aaaggatctt cacctagatc cttttatcgg tgtgaaatac cgacacagatg 2100  
cgtaaggaga aaataccgca toagggaaatt gtaagcgta ataattcaga agaactcgta 2160  
aagaaggcga tagaaggcga tgcgcgtcga atcgggagcg ggcataccgt aaagcacgag 2220  
gaagcggtca gcccattcgc cgccaaagcgc ttccagcaata tcacgggttag ccaacgcstat 2280  
gtcctgatag cggtccgcac caccggccg gccacagtcg atgaatccag aaaagcggcc 2340  
atttccacc atgatattcg gcaagcgggc atgcgcattt gtcacgcga gatctcgcc 2400  
gtcgggcatg ctcgccttga gcttggcgaa cagttccgtt ggcgcgagcc cctgatgctc 2460  
ttcgtccaga tcatcctgtat cgacaagacc ggcttccatc cgagttacgtg ctcgcctcgat 2520  
gcgatgtttc gcttgggtt cgaatgggca ggtagccgga tcaagcgat gcagccggcc 2580  
cattgcataa gccatgatgg atactttctc ggcaggagca aggtgagatg acaggagatc 2640  
ctgccccggc acttcgcctca atagcagccaa gtccttccc gtttcgtatgca caacgtcgag 2700  
cacagctgcg caaggaacgc ccgtcggttcc cagccacgtt agccgcgtg cctcgcttgc 2760  
cagttcatttcc agggcaccgg acaggtcggtt cttgacaaaaa agaaccgggc gcccctgcgc 2820  
tgacagccgg aacacggcgg catcagagca gccgattgtc tggtgtgccc agtcatagcc 2880  
gaatagccctc tccacccaag cgccgggaga acctgcgtgc aatccatctt gttcaatcat 2940  
gcgaaacgtat cctcatcttgc tctcttgcata agagttgtat cccctgcgc atcagatcct 3000  
tggccggcgg aaagccatcc agtttactttt gcagggttttgc tcaaccttac cagataaaag 3060  
tgcgtcatcat tggaaaacgt tcaattctga ggcggaaaaga accagctgtg gaatgtgtgt 3120  
cagttagggt gtggaaagtc cccaggctcc ccagcaggca gaagtatgca aagcatgcat 3180  
ctcaattatgt cagcaaccag gtgtggaaag tccccaggctt ccccaaggcagg cagaagtatg 3240  
caaagcatgc atctcaattt gtcagcaacc atagttccgc cccataactcc gcccattcccg 3300  
ccctctaactc cggccaggatc cggccatttgc ccccccatttgc gctgactaat tttttttatt 3360  
tatgcagagg cccaggccgc ctcggcccttgc gagctattcc agaagtagtg aggaggctt 3420  
tttggaggcc taggcttttgc caaaaagctt gatttttgc acacaacagt ctcgaactta 3480  
aggctagagc caccatgattt gaaacaagatg gattgcacgc aggttctccg gcccgttggg 3540  
tggagaggctt attcggctat gactgggcac aacagacaat cggctgtct gatccgcgg 3600  
tggccggct gtcagcgcag gggcccccggg ttcttttgc caagaccgcgatg cttccgggtg 3660  
ccctgaatga actgcaggac gaggcagcgcg ggcatactgcg gctggccacg acggcggttc 3720  
cttgcgcagc tggctcgac gttgtacttgc aagcggaaag ggactggctg ctattggcg 3780  
aagtggccgg gcaaggatctc ctgtcatctc accttgcgtcc tgccgagaaa gtatccatca 3840  
tggctgtatgc aatgcggccgg ctgcatacgc ttgatccggc tacctgccttca ttcgaccacc 3900  
aaggaaaca tgcatacgatcgatcgatgcgatggaa ggcgggtttt gtcgtatcagg 3960  
atgatctggat cgaagagcat caggggctcg cgccagccga actgttcgc acggctcaagg 4020  
cgccatgcgc cgcggcgatgc gatctcgatgc tgaccatggat cgtgcctgc ttgcgcata 4080  
tcatgggttgc aaatggccgc ttttctggat tcatcgacttgc tggtggccgtg ggtgtggcg 4140  
accgttatca ggacatagcg ttggcttaccgc gtgatattgc tgaagagctt ggcggcgaat 4200  
gggtgtaccgc cttccctcgat ctttacggta tcgcccgtcc cgattcgatcgatgc cgcatacgatgc 4260  
tctatgcctc tcttgcgtatgc ccattctgtat ggtatggctac aggtgcgcagc cctggcgatgc 4320  
tgattatgtatgc tggatggat ttttgcgttgc tggatatttttgcataatcattatgc 4380  
ctgaggattt ggaaagggtt ttattccctc atggactaat tatggacagg actgaacgtc 4440  
ttgtgtcgatgc tggatggat gggatggat ggcataatcgtc tggtgtgtatgc 4500  
aggggggctt taaattctt gtcgacccgtc tggattacat caaagcactg aatagaaata 4560  
gtgatagatc cattccatgc actgttagattt ttatcgacttgc gaaagagctt gtaatgacc 4620  
agtcaacagg ggacataaaaa gtaattggat gggatgtatc tcaacttgc actgaaaga 4680  
atgtcttgcgtatgc tggatggat gggatggat gggatgtatc tcaacttgc actgaaaga 4740

tggtcaggca gtataatcca agatggtca aggtcgcaag cttgctggtg aaaaaggaccc 4800  
cacgaagtgt tggatataag ccagactttg ttggatttga aattccagac aagtttgg 4860  
taggatatgc ccttgactat aatgaatact tcagggattt gaatcatgtt tgtgtcatta 4920  
gtgaaaactgg aaaagcaaaa tacaaaggct aagcggccgc taacctggtt gctgactaat 4980  
tgagatgcat gcttgcatata cttctgcctg ctggggagcc tggggacttt ccacacccta 5040  
actgacacac attccacagc tggtttttc cgcctcagaa ggtacacagg cgaaattgt 5100  
agcgtaata ttttgttaaa attcgctta aattttgtt aatcagctc attttttaac 5160  
caataggccg aaatcgccaa aatcccttat aaatcaaaaag aatagaccga gatagggtt 5220  
agtgttggtc cagtttggaa caagagtcca ctattaaaga acgtggactc caacgtcaaa 5280  
gggcgaaaaa ccgtctatca gggcgatggc ccac 5314

<210> 28  
<211> 9737  
<212> DNA  
<213> Homo sapiens

<220>  
<221> modified\_base  
<222> (8347)  
<223> a, c, t, g, other or unknown

<220>  
<221> modified\_base  
<222> (8499)  
<223> a, c, t, g, other or unknown

<400> 28  
gatcttcaat attggccatt agccatatta ttcattggtt atatagcata aatcaatatt 60  
ggctattggc cattgcatac gttgtatcta tatcataata tgtacattt tattggctca 120  
tgtccaatat gaccgcctat tggcattga ttattgacta gttattaata gtaatcaatt 180  
acggggtcat tagttcatag cccatatatg gagttccgcg ttacataact tacggtaat 240  
ggccgcctg gctgaccgc caacgacccc cgcccatattga cgtcaataat gacgtatgtt 300  
cccatagtaa cgccaaatagg gactttccat tgacgtcaat gggtgagta tttacggtaa 360  
actgcccact tggcagtaca tcaagtgtat catatgccaa gtccggcccc tattgacgtc 420  
aatgacggta aatggccgc ctggcattat gcccagtaca tgaccttacg ggactttcct 480  
acttggcagt acatctacgt attagtcattc gctattacca tggtgatgct gtttggcag 540  
tacaccaatg ggcgtggata gogggttgc tcacgggat ttccaagtct ccacccatt 600  
gacgtcaatg ggagttgtt ttggcaccaa aatcaacggg actttccaaa atgtcgtaac 660  
aactgcgatc gcccgcctt ttgacgcaaa tggggcgttag gcgtgtacgg tggaggtct 720  
atataagcag agctcgatca gtgaaccgc agatcaactga attctgacga cctactgatt 780  
aacggccata gaggcctcct gcagaactgt cttagtgaca actatcgatt tccacacatt 840  
atacgagccg atgttaattt tcaacagctc atgcatgacg tcccgggagc agacaagccc 900  
gaccatggct cgagtaatac gactcaactat agggcagacag gtgagtaactc gctaccttaa 960  
ggcctatctg gccgtttaaa cagatgtgtta taagagacag ctctcttaag gtggcgtc 1020  
tcttatacac atctagatcc ttgcttaggt cgaccaattc tcatgttgc cagtttatca 1080  
tcgcagatcc tgagcttgc tggtgactc tcagttacaat ctgctctgtt gcccatagt 1140  
taagccagta tctgctccct gcttgtgtt tggaggtgc tgagtagtgc gcgagcaaaa 1200  
tttaagctac aacaaggcaa ggcttgaccg acaattgcat gaagaatctg cttagggtt 1260  
ggcggtttgc gctgctcgc gatgtacggg ccagatatac gcgtatctga ggggactagg 1320  
gtgtgttttag gcccgcgc gggcttcggt tgtacgcggt taggagtccc ctcaggat 1380  
agtagttcg cttttgcata gggaggggaa aatgttagtct tatgcaatac acttgttagtc 1440  
ttgcaacatg gtaacgatga gtttagcaaca tgccttacaa ggagagaaaa agcaccgtgc 1500  
atgccgattt gttggaaat ggtggatcgta tcgtgcctta ttaggaaggc aacagacagg 1560  
tctgacatgg attggacgaa ccactgaatt ccgcattgca gagataattt tatttaagt 1620  
cctagctcga tacaataaac gccatttgcac cattcaccac attgggtgtc acctccaagc 1680  
tgggtaccag ctgctagcct cgagacgcgt gatttccttc gaagcttgc atgggtggtt 1740  
cgctaaactg catcgctcgct gtgtcccaga acatgggcat cggcaagaac ggggacctgc 1800  
cctggccacc gctcaggaat gaattcagat attccagag aatgaccaca acctcttcag 1860

tagaaggtaa acagaatctg gattatgg gtaagaagac ctgggtctcc attcctgaga 1920  
agaatcgacc tttaaagggt agaattaatt tagttctcag cagagaactc aaggaacctc 1980  
cacaaggagc tcattttctt tccagaagtc tagatgatgc cttaaaactt actgaacaac 2040  
cagaattagc aaataaaagta gacatggct ggatagttgg tggcagttct gtttataagg 2100  
aagccatgaa tcacccaggc catcttaaac tattttgtac aaggatcatg caagactttg 2160  
aaagtgacac gtttttcca gaaattgatt tggagaataataaacttctg ccagaataacc 2220  
caggtgttct ctctgatgtc caggaggaga aaggcattaa gtacaaattt gaagtatgt 2280  
agaagaatgt taattaaggc caccaataac tgccttaaaa aaattacgccc 2340  
actcatcgca gtactgttgc aattcattaa gcattctgcc gacatggaaag ccacacaga 2400  
cgccatgtg aacctgaatc gccagcggca tcagcacctt gtcgccttgc gtataatatt 2460  
tgcccatggt gaaaacgggg gcgagaagt tgcctatatt ggcacgtt aaatcaaaac 2520  
tggtggaaact cacccaggaa ttggctgaga cgaaaaacat attctcaata aacccttttag 2580  
ggaaataggc caggtttca ccgtaacacg ccacatctt cgaatataatg tggtagaaact 2640  
gccggaaatc gtcgtggat tcactccaga gcgatgaaaa cgtttcagtt tgctcatgga 2700  
aaacgggtga acaagggtga acactatccc atatcaccag ctcaccgtct ttcattgcca 2760  
tacggattc cgatgagca ttcatcaggc gggcaagaat gtgataaag gcccggataaa 2820  
acttgtgctt attttctt acggcttttta aaaaggccgt aatatccagc tgaacggct 2880  
ggttataggt acattgagca actgactgaa atgcctcaaa atgttcttta cgatgcccatt 2940  
gggatatac aacgggtga tatccagtga ttttttctc catttttagct tccttagctc 3000  
ctgaaaatct cgataactca aaaaatacgc ccggtagtga tcttatttca ttatggtaa 3060  
agttggaaacc tcttacgtgc cgatcaacgt ctcattttcg ccaaattaat taaggcgcgc 3120  
cgctctcctg gctaggagtc acgtagaaag gactaccgac gaaggaactt gggtcgccgg 3180  
tgtgttcgtat tatggaggtta gtaagaccc cctttacaac ctaaggcgag gaactgccc 3240  
tgctatttca caatgtcgat ttacaccatt gagtgcgtc ccctttggaa tggcccctgg 3300  
acccggccca caacctggcc cgctaaggga gtccattgtc tggtagttca tggttttttt 3360  
acaaaactcat atatttgcgt aggttttggaa ggatgcgtt aaggacctt ttaggacaaa 3420  
gcccgctcct acctgcaata tcagggtgac tggtagtgc tttgacgtg gaggtagattt 3480  
gcctccctgg tttccaccta tggtaggaaagg ggctggcg gagggtgatg acggagatga 3540  
cgagatgaa ggaggtgatg gagatgaggg tgaggaaagg caggagtgtat gtaacttgg 3600  
aggagacgccc ctcaatcgta taaaagccg tggatcccc cgcactaaag aataatccc 3660  
cagtagacat catgcgtgt gtgggtgtat ttctggccat ctgtcttgc accattttcg 3720  
tcctcccaac atggggcaat tggcataacc catgttgc tgcactcag ctccgcgc 3780  
aacaccttct cgcgttggaa aacatttagcg acatttacct ggtgagcaat cagacatgcg 3840  
acggctttag cctggcctcc taaattcac ctaagaatgg gagcaaccag catgcaggaa 3900  
aaggacaago agcgaaaattt caccggccct tggggatggg cggcatatgc aaaggatagc 3960  
actccccactc tactactggg tatcatatgc tgactgtata tgcgttaggaa tagcatatgc 4020  
tacccggata cagatttagga tagcatatac taccagata tagatttagga tagcatatgc 4080  
tacccagata tagatttagga tagcctatgc taccagata taaatttagga tagcatatac 4140  
tacccagata tagatttagga tagcatatgc taccagata tagatttagga tagcctatgc 4200  
tacccagata tagatttagga tagcatatgc taccagata tagatttagga tagcatatgc 4260  
tatccagata tttgggtgtat atatgttacc cagatataaa ttaggatagc atataactacc 4320  
ctaattctta ttggatagc atatgttacc cggatacaga ttggatagc atataactacc 4380  
cagatataga ttggatagc atatgttacc cagatataga ttggatagc ctatgttacc 4440  
cagatataaa ttggatagc atataactacc cagatataga ttggatagc atatgttacc 4500  
cagatataga ttggatagc ctatgttacc cagatataga ttggatagc atatgttacc 4560  
cagatatttgg ggtgtatgt gtcacccatg gcaacattt cccaccgtgc tctcagcgc 4620  
ctcgtaata tgaggaccaa caaccctgtt cttggcgctc aggcgc 4680  
tgttctccat atcgaccaa tggcccccctt atcttggccc gcccacccatc ttatgcagg 4740  
atccccggg gtggcatttag tgggtttgtt ggcaagtggg ttgaccgcag tggtagcgg 4800  
ggttacaatc agccaaatgtt ttcacaccctt attttacagt cccaaaccgc agggcggcgt 4860  
gtgggggctg acgcgtgccc ccactccaca atttcaaaaaaa aagaggtggc cacttgc 4920  
tgtttatggg ccccatggc tggtaggggg gtttattttt cgggggtgtt agagacaacc 4980  
agtggagtcc gtcgtgtcg gctccactc tctttccct ttttacat aggtgtaac 5040  
aacatggttc acctgttgc gtcctgcctt gggacacatc ttaataaccc cagtatcata 5100  
ttgcactagg attatgtgtt gccatagcc ataaattcgat gtgagatggc catccatgc 5160  
ttacggcttgc tcccccccccc atggatttctt attgttaaag atattcagaa tggtagtgc 5220  
ctacactagt atttatttgc caaggggtttt gtgagggttta tattgggtgc atagcacaat 5280  
gccaccactg aaccccccgt cccaaattttta ttctggggc gtcacccatc acctgtttt 5340  
cgagcacctc acatacacatc tactgttgc aactcagcag ttattctatt agctaaacga 5400

aggagaatga agaagcaggc agattcag gagagttcac tgcccgctcc tgcgttca 5460  
gccactgccc ttgtactaa aatggttcac taccctcggt gaatcctgac cccatgtaaa 5520  
taaaaccgtg acagctcatg ggggtggaga tatcgtctt ctttaggacc cttttactaa 5580  
ccctaattcg atagcatatg cttcccggtt ggtaacatat gctattgaat tagggttagt 5640  
ctggatagta tatactacta cccgggaagc atatgttacc cggttaggtt taacaagggg 5700  
gccttataaa cactattgt aatggctctt tgagggctcg cttatcggtt gctacacagg 5760  
ccctctgtat tgacgttggt gtgcctccc gtatgttcc tgggccccctg ggaggtacat 5820  
gtccccccagc attgggttaa gagcttcagc caagagttac acataaaaggc aatgttgtgt 5880  
tgcagtccac agactgcaaa gtcgtctcca ggatgaaagc cactcagtgt tggcaaatgt 5940  
gcacatccat ttataaggat gtcactaca gtcagagaac ccctttgtgt ttgggtcccc 6000  
cccggtgtcac atgtggaaaca gggcccagtt ggcaagttgt accaaccac tgaagggatt 6060  
acatgcactg ccccgaatac aaaacaaaaag cgctoctcg accagcgaag aaggggcaga 6120  
gatgccgtag tcaggtttag ttgcgtccggc ggccggccggc cgcaaggcgc gccggatcca 6180  
cagacgggt gtggtcgcca tgatcggtt gtcgtatgt gctccaagta gcaagcgg 6240  
cagactggg cggccggccaa agcgggtcgga cagtgtccg agaacgggtt cgcatagaaa 6300  
ttgcataac gcatatacg gtagatcctt gctagatgtc agatctgtc agccatgtga 6360  
gcaaaaaggcc agcaaaaaggc caggaaccgt aaaaaggccg cggtgctggc gttttccat 6420  
aggctccgccc cccctgacga gcatcacaaa aatcgacgtt caagtcaagag tggcgaaac 6480  
ccgacaggac tataaaagata ccaggcggtt cccctggaa gtcctcgat ggcgtctcct 6540  
gttccgacc tggcgcttac cggtatcctt tccgccttc tcccttcggg aagcgtggcg 6600  
ctttctcata gtcacgctg taggtatctc agttcggtgt aggtcggtc ctccaagctg 6660  
ggctgtgtgc acgaaccccc cgttcagccc gaccgtcgcc cttatccgg taactatcgt 6720  
ctttagtcca acccggtaag acacgactt tcgcaactgg cagcagccac tggtaacagg 6780  
attagcagag cgaggtatgt aggccgtgtc acagatgtt tgaagtgggt gcctaactac 6840  
ggctacacta gaaggacagt atttggtattc tgctgtctgc tgaagccagt taccttcgga 6900  
aaaagagttt gtagcttttgc atccggcaaa caaaccaccc ctggtagcgg tggttttttt 6960  
gtttgcaagc agcagattac ggcggaaaaaa aaaggatctc aagaagatcc tttgatctt 7020  
tctacggggt ctgacgctca gtggaaacgaa aactacgtt aaggatttt ggtcatgaga 7080  
ttatcaaaaa ggtatcttcac cttagatcctt ttatcggtgt gaaataccgc acagatcggt 7140  
aaggagaaaa taccgcatca gggaaattgtt agcgttaata attcagaaga actcgtaag 7200  
aaggcgatag aaggcgatgc gtcgcaatc gggagccggcgtt ataccgtaaa gcaaggaggaa 7260  
gcggtcagcc cattcgccgc caagctttc agcaatatca cgggtagccca acgtatgtc 7320  
ctgatagcgg tccgcacac ccagccggcc acagtcgtt aatccggaaaa agcggccatt 7380  
ttccaccatg atattcgca agcaggcattt gccatgggtc acgacgagat ctcgtccgtc 7440  
ggcgtctcgc gccttgcgttcc tggcgaaacag ttccgttgc gcgagccctt gatgtcttc 7500  
gtccagatca tcctgtatcga caagaccggc ttccatccga gtacgtgtc gtcgtatgcg 7560  
atgtttcgct tgggtgtcga atgggcagggt agccggatca acgtatgtca gcccggccat 7620  
tgcatacgcc atgatggata ctgttctcggtt aggaccaagg tggatgtaca ggagatccgt 7680  
ccccggcact tggcccaata gcaagccgtt cttcccgct tcgtgacaa cgtcgacac 7740  
agctgcgcaaa ggaacggcccg tcgtggccag ccacgatagc cgcgtcgct cgtttgcag 7800  
ttcattcagg gcaccggaca ggtcggttcc gacaaaaaaga accggggccgc cctgcgtga 7860  
cagccggaaac acggcggtcat cagacggccat gattgtctgt tggcccgatg catagccaa 7920  
tagcctctcc acccaaggcc cccggagaacc tgcgtcaat ccatcttgc caatcatgtcg 7980  
aaacgatcct catcctgtct ctgtatcga gcttgcgttcc ctgcgtccatc agatccttgg 8040  
cgccgagaaaa gccatccagt ttactttgc gggctgtca accttaccag ataaaagtgc 8100  
tcatcattgg aaaacattca attcgtcgac ctgcgttcc taccgggtt gggaggcgct 8160  
tttcccaagg cagtctggag catgcgtttt agcagccccc ctgggcactt ggcgtacac 8220  
aagtggcctc tggcctcgca cacattccac atccaccgggtt aggcggccaaac cggctccgtt 8280  
ctttgggtggc cccttcgcgc caccttctac tcctccctt gtcaggaatg tccccccgc 8340  
cccgcanctc gctgtcgca ggacgtgaca aatggaaata gcaacgtctca ctgtctcg 8400  
gcagatggac aagcaccgtt gaccaatggc gcccgttggc ctggggccatc gcccggccata 8460  
gcagcttgc tccttcgtt tctgggtgtca gaggctggna aggggtgggtt ccggggggccgg 8520  
gctcaggggc gggctcagggtt gcccggccggc cggccgttcc gtcgtccggag gcccggcatt 8580  
ctgcacgctt caaaacggca cgtctcgccgc gctgttctcc ttccatcttccat ctccggccct 8640  
ttcgacactgc atccatcttag attcgtcgac gctgtatgtt accatgtaccc agtacaagcc 8700  
caccgtcgcc ctcgtccaccc gcaacgtacgtt ccccccggcc gtcgtccatcc tcgcccggcc 8760  
gttcggccgac taccggccca cggccacac cgtcgacccgg gaccggccaca tcgacgggtt 8820  
caccggagctg caagaactct tccctcgtcg cgtcggttcc gacatcggtt gacgtgtgggt 8880  
cgccggacgac ggcggccggg tggcggtctg gaccacggccg gacgtcgatcc aagcggggcc 8940

ggtgttcgcc gagatcgccc cgcatggc cgagttgagc gttccggc ggccgcgc 9000  
gcaacagatg gaaggcctcc tggcgccgc cggggccaa ggagccgcg tggtcctt 9060  
gccaccgtc gggcgcttc gcccgaccac cagggcaagg gtctggcaag cgccgtcgt 9120  
ctccccggag tggaggcggc cgagcgcgc ggggtgccc cttccttgg aacctccgc 9180  
ccccgcaacc tcccctcta cgagcggtc ggcttcaccc tcaccggca cgtaggggtg 9240  
ccccaggac cgccacactg gtgcattgacc cgcaagcccg gtgcctgacg cccgccccac 9300  
gaccgcgc gcccgaccga aaggagcgcga cgaccatg catcgatggc actgggcagg 9360  
taagtatcaa gtttagcggc cgctaaccctg gttgtact aattgagatg catgtttgc 9420  
atacttctgc ctgctggga gcttgggac tttccacacc ctaactgaca cacattccac 9480  
agctggttct ttccgcctca gaaggtacac aggcgaaatt gtaagcgtt atatttttt 9540  
aaaatttcgcg ttaaattttt gtaaattttag ctcattttt aaccaatagg ccgaaatcgg 9600  
caaaaatccct tataaatcaa aagaatagac cgagatagg ttgagtgtt ttccagttt 9660  
gaacaagagt ccactattaa agaacgtgga ctccaacgtc aaaggcgaa aaaccgtcta 9720  
tcagggcgat ggcac 9737

<210> 29  
<211> 12  
<212> DNA  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence: Vector  
Promoter  
  
<400> 29  
acccaggtga tg 12  
  
<210> 30  
<211> 15  
<212> DNA  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence: Vector  
Promoter  
  
<400> 30  
accatgcagg tgatg 15  
  
<210> 31  
<211> 16  
<212> DNA  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence: Vector  
Promoter  
  
<400> 31  
accatggcag gtgatg 16  
  
<210> 32  
<211> 17  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Vector  
Promoter

<400> 32  
accatgggca ggtgatg

17

<210> 33  
<211> 10  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Vector

<220>  
<223> polyA tail

<400> 33  
aaaaaaaaaa

10

App

**NOTICE TO COMPLY WITH REQUIREMENTS FOR PATENT APPLICATIONS CONTAINING  
NUCLEOTIDE SEQUENCE AND/OR AMINO ACID SEQUENCE DISCLOSURES**

Applicant must file the items indicated below within the time period set the Office action to which the Notice is attached to avoid abandonment under 35 U.S.C. § 133 (extensions of time may be obtained under the provisions of 37 CFR 1.136(a)).

The nucleotide and/or amino acid sequence disclosure contained in this application does not comply with the requirements for such a disclosure as set forth in 37 C.F.R. 1.821 - 1.825 for the following reason(s):

1. This application clearly fails to comply with the requirements of 37 C.F.R. 1.821-1.825. Applicant's attention is directed to the final rulemaking notice published at 55 FR 18230 (May 1, 1990), and 1114 OG 29 (May 15, 1990). If the effective filing date is on or after July 1, 1998, see the final rulemaking notice published at 63 FR 29620 (June 1, 1998) and 1211 OG 82 (June 23, 1998).

2. This application does not contain, as a separate part of the disclosure on paper copy, a "Sequence Listing" as required by 37 C.F.R. 1.821(c).

3. A copy of the "Sequence Listing" in computer readable form has not been submitted as required by 37 C.F.R. 1.821(e).

4. A copy of the "Sequence Listing" in computer readable form has been submitted. However, the content of the computer readable form does not comply with the requirements of 37 C.F.R. 1.822 and/or 1.823, as indicated on the attached copy of the marked -up "Raw Sequence Listing."

5. The computer readable form that has been filed with this application has been found to be damaged and/or unreadable as indicated on the attached CRF Diskette Problem Report. A Substitute computer readable form must be submitted as required by 37 C.F.R. 1.825(d).

6. The paper copy of the "Sequence Listing" is not the same as the computer readable form of the "Sequence Listing" as required by 37 C.F.R. 1.821(e).

7. Other: \_\_\_\_\_

**Applicant Must Provide:**

An initial or substitute computer readable form (CRF) copy of the "Sequence Listing".

An initial or substitute paper copy of the "Sequence Listing", as well as an amendment directing its entry into the specification.

A statement that the content of the paper and computer readable copies are the same and, where applicable, include no new matter, as required by 37 C.F.R. 1.821(e) or 1.821(f) or 1.821(g) or 1.825(b) or 1.825(d).

For questions regarding compliance to these requirements, please contact:

For Rules Interpretation, call (703) 308-4216

For CRF Submission Help, call (703) 308-4212

PatentIn Software Program Support

Technical Assistance.....703-287-0200

To Purchase PatentIn Software.....703-306-2600

**PLEASE RETURN A COPY OF THIS NOTICE WITH YOUR REPLY**